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Address.

SOME PRESENT DAY PROBLEMS IN SURGERY.*

BY MICHAEL F. FALLON, M.D., LL.D., F.A.C.S., WORCESTER, MASS.

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THE address, which I have the honor to present to you, was prompted by the remark of an estimable country physician with whom I recently spent an evening. He said that his study of some surgical subjects frequently resulted in mental confusion because of the many conflicting views in surgical literature. "Consider," he said, "the vast amount of literature—pro and con—in reference to Lane's doctrines. How can country doctors, isolated as we are, come to any conclusion in reading so many conflicting opinions?"—orthodoxy in one mail; heresy in the next.

Since our society is composed mostly of physicians, the writer, in this address, has tried to avoid a discussion on surgical technique, and gives his view-point on some present day problems in surgery gleaned from the studies of the results of master surgeons; and he takes the liberty to add some data observed by himself in his surgical investigations.

INTESTINAL STASIS.

Probably the most discussed surgical subject today is that of "intestinal stasis," and the champion for certain surgical procedures for relief of this ailment, Mr. Lane, says:[1]

"By chronic intestinal stasis, I mean that the passage of the contents of the intestinal canal is delayed sufficiently long to result in the production, in the small intestine especially, of an excess of toxic material, and in the absorption into the circulation of a greater quantity of poisonous products than the organs which convert and excrete them are able to deal with.

"In consequence, there exist in the circulation materials which produce degenerative changes in every single tissue of the body, or which lower its resisting power against invasion by deleterious organisms.

"Owing to unsuitable diet in infancy and to habitual assumption of the erect position, delay of fecal material takes place in the large bowel, or cesspool, of the gastrointestinal tract, or, as it can be best described, the 'general drainage system of the body.'

"In consequence of this, new membranes or resistances to downward displacement are formed by the crystallization of lines of force upon the surface of the peritoneum along which strain is especially exerted."

As regards treatment, Mr. Lane says:

"The point of practical interest is that the drainage scheme be made to work efficiently by mechanical means, or by operative interference, and that the resisting power of the tissues of the body is such that they can destroy the organisms or poisons, if not advanced too far, or if cancer has not developed.

And nothing is more remarkable in the whole range of surgery than the result of the removal of the large bowel in a case of rheumatoid arthritis. The transition is abrupt and startling."

* Read before the Worcester District Medical Society, December 8, 1915.

Lane's theory as to "intestinal stasis and auto intoxication" resulting from kinks, new membranes, visceroptosis, is not new.

Glénard, in 1855, gave an accurate description of ptosis of the viscera, and he ascribed, as a cause for constipation, the kinks (angulations) due to visceroptosis.

Virchow, as far back as 1853,[2] described the peri-colic membrane due, he thought, to fecal stasis.

The theory of auto-intoxication due to intestinal stasis was advocated years ago by various medical men, *e.g.* Bouchard, Combe. Hence, there is nothing new about Lane's theory.

The term intestinal stasis is rather a novel one devised by Lane for the more prosaic one of chronic constipation. It is not, as yet, proved that constipation causes auto-intoxication; and the symptoms that the term auto-intoxication—a vague term—means to convey may, in reality, be due to various diseases, *e. g.* mal-nutrition or to various nervous phenomena.

Lane's theory and his operative procedures based upon this theory have not been generally accepted as a clinical or surgical pathological entity. In fact, the opinions of many medical scientists concerning Lane's views may be summed up in the characterization of them by Adami: "They seem to be a horrible jumble." The frequently obscure syndrome of abdominal symptoms—pain, constipation and gas-distention—have, during the past few years, given rise to other theories as to their causation. And next to Lane's theory, perhaps the one most discussed is the so-called movable cecum (Cecum Mobile, Wilms).

Formerly, chronic appendicitis was generally held responsible for symptoms of pain and constipation, but when operative results of many surgeons were made known, it was found that frequently these symptoms continued despite the ablation of the appendix. (Wilms says that 30% of operations for chronic appendicitis are disappointing).

Another theory advanced to explain these symptoms is that of the too-restricted cecum, the opposite of the too-movable cecum; and the too-restricted cecum is said to be due to a peri-cecal membrane accurately described by Jackson.

The respective advocates of these two conditions—the too-movable cecum and the too-restricted cecum—who wish to establish them as pathological entities, claim that the too-limited movements of the cecum (due to Jackson's membrane), and the too-free movements of the cecum (cecum mobile), cause a mechanical interference with the first part of the large intestine, with resulting stasis, and may thus cause pain, constipation and gas-disturbance.

Various surgical procedures applicable to these two conditions have arisen, and even now are somewhat practised. Briefly, these surgical procedures are: In the case of the too-movable cecum to bind down the intestine to the parietal peritoneum, and thus limit its too free movements. In the case of the too-restricted cecum, on the other hand, to loosen up the cecum and ascending colon by cutting the enveloping membrane. (Jackson's membrane).

Sufficient research work, both clinical and surgical, warrants, I believe, a final judgment as to whether these two conditions be accepted as pathological entities. The opinion among surgeons in general, as in the case of Lane's theory, is against so accepting them, since investigations have shown that the too-movable cecum occurs frequently enough to be called normal, and that Jackson's veil is always present and is a normal structure. (The writer ventures an opinion as to the pathology of the movable cecum, and of Jackson's veil, inasmuch as he has studied these structures on the operating table, and has examined one hundred consecutive subjects in the Harvard Medical School with reference to them. In both the operating and dissecting room, he has found that the movable cecum is present in about one-fourth of all subjects; and Jackson's veil is always present).

The writer, in 1913, said:[3]

"There is a great deal of confusion in the various theories as to the cecum and the surrounding membranes being the source of constipation and pain, and in some of these theories, a very important physiological fact may be lost sight of, *i.e.* that digestion in man requires the retarding of the food current in the ascending colon. The accumulation in the beginning of the large intestine, in itself, is not pathological.

"Sonnenburg,[4] Huntington,[5] and Cannon[6] have shown that many of the features of the large intestine instead of being a menace to the well-being of man (Metchnikoff, Lane) are, on the contrary, most admirably adapted to the completion of his digestion.

"Food in transit from the stomach to the anus usually requires from 24 to 36 hours, only 6 to 8 of which are occupied by the small, and the remainder by the large intestine. Most of the nutriment is absorbed in the small intestine, but about 50% of the fluids, and 10% of the solids are absorbed in the first half of the large intestine; and here necessarily, because of the character of the nutriment, a longer time is necessary for absorption. Even the anatomical, up-hill arrangement of the ascending colon serves a physiological purpose.

"The splenic flexure of the colon is held high as a mechanical means of maintaining food products as long as possible in the first half of the large intestine. This method of retention is more economic in its operation than a muscular sphincter apparatus would be.[7]

"Even when the cecum is of moderate size or rudimentary, as in the cat, prolonged retention of the material delivered by the small intestine is provided for in the reversed peristalsis which prevails in the proximal colon.

"Food, rich in cellulose, may remain in this region (cecum) for days undergoing changes which result in its being utilized in the body. On the

other hand, in carnivorous animals, digestion occurs principally in the stomach and small intestine; the cecum is either rudimentary or absent.[6]

"Therefore, the construction of the large intestine in man with its accessory modifications[5] favors the retarding of the food current in its first portion for physiological purposes; and when this retarding amounts to a pathological stasis, with its accompanying symptoms of pain and constipation, the causes may be sought for elsewhere, and frequently may be traced to faulty habits and neglect of physiological laws. It is a noteworthy fact that this pathological stasis obtains mostly in women (75%, Wilms[8]), and is frequently associated with gastrocoloptosis."

Hence, obstinate constipation of functional origin, and its concurrent symptoms, should be treated by hygienic, dietary and therapeutic rather than by surgical measures. Ileo-colostomy or colectomy at times is advisable in organic disturbances of the bowel, *e.g.* cancer, but not in functional disturbance. (One use of the colon is to be sure, as Lane says, that of a "sewer," but the colon has physiological uses other than those of a "drainage tube," and it has been shown that, even though a man may live without a colon, the ablation of the colon leaves the patient vulnerable to many dangers, and especially to certain intestinal disorders.[9]) William Mayo, in his matter-of-fact way, briefly and wisely sums up such radical procedures on the gastrointestinal tract:[7] "That many of the patients operated on have been greatly benefited cannot be denied, yet, if one were to take the case histories and reports of successful treatment by means of such mechanical therapy, and put them all in a hat to be picked out at random, one could not determine from the histories of the patients those who had been relieved of symptoms by operating for mobile cecum, for relief of adhesions, for mobility of the sigmoid, for fixation of the sigmoid, for prolapse of the stomach, and, for that matter, for movable kidney. The histories read alike, but the operations seem to vary with the bias of the operator. Are all of these deductions wrong? Have the profession in regular medicine, with their accurate observations, no conclusions which depend upon more authentic data? To say that relief of symptoms demonstrates the truth of the opinion is not sufficient unless we grant the same privilege to the mental healers." As regards the advocacy of many of the radical operative measures on the gastrointestinal tract for the syndrome of symptoms of pain, gas-distention and constipation, the remark of Caesar may be applicable. He said: "Most men willingly believe what they wish to believe." The scientist, and this applies to other than Christian scientists, becomes interested in his hobby; and he develops that hobby by making all his evidence support it. Mr. Lane's associate says that he had never noticed the obstructing membranes in red-haired women! No wonder that a conscientious physician becomes confused in his conduct of such cases.

I have often thought what a blessing it is for the people of this community that our local physicians and surgeons do not lend themselves to such radical and often death-dealing measures as are advocated by the champions of various new operations on the gastrointestinal tract.

PRESENT DAY ATTITUDE CONCERNING APPENDICITIS.

Dr. Mixter[10] has well said, "Probably more necessary operations on the appendix have been left undone, and more unnecessary operations have been done on it than on any other organ in the body." Surgeons and physicians today, with very few exceptions, advocate an immediate operation in an undoubted case of acute appendicitis. But at times, it is impossible for most experienced surgeons definitely to diagnose appendicitis when the abdominal symptoms are obscure and do not point positively to the appendix as the offending organ. A chronic appendix not infrequently gives symptoms that are misleading.

We know now that many cases of so-called dyspepsia are, in reality, due to chronic appendicitis. Ulcer of the stomach is not infrequently diagnosed when, in reality, the lesion is appendicitis. Perhaps there is no surgeon whose conclusions on abdominal diseases are more reliable than are those of Moynihan.[11] He thus writes concerning the mimicry of ulcer by appendicitis. "There is no longer any doubt in my own mind that the commonest site of a 'gastric ulcer' is in the right iliac fossa, and generally from appendicitis. In many of the cases of gastric ulcer, the symptoms of which are pain, flatulence, acidity, heart-burn, vomiting and hematemesis, the lesions primarily responsible for such symptoms do not lie in the stomach. The lesion is one in which infection and obstruction are in league to do harm, and its most frequent location is in the appendix."

It is the experience of every surgeon to see gastric symptoms clear up after the removal of the appendix. I recall the case of a physician of our Society. He had been sorely troubled for years with an apparent stomach ailment; he was operated for acute appendicitis, and after this, he had no more trouble with his stomach. This case was to me particularly instructive from the stand-point of diagnosis, since even this physician, an up-to-date man, located his trouble because of the gastric symptoms, in his stomach, when, in reality, the appendix was the sole cause of it.

There is no question that the appendix is the most potent and most frequent cause of offence in the abdomen. Most cases of appendicitis are easily diagnosed. What should be our procedure in ill-defined abdominal cases in which we cannot be positive, but in which the preponderance of evidence points to the appendix? In all such cases, when other abdominal diseases

can reasonably be eliminated, the removal of the appendix will generally give the patient relief. At times, in some obscure cases, when the evidence points to the appendix, the history of appendicitis in some other member of the family will aid in the diagnosis. In the writer's experience, about one-fifth of the patients operated for appendicitis give a family history in which one or more members have had appendicitis.

GALL-STONES.

What is the present day practice in regard to gall-stones? In advanced gall-stone cases, when no contra-indication exists, there can be but one opinion; and most surgeons now favor the removal of the gall-bladder—an expansion organ, and not a reservoir for bile, as formerly thought. There is a difference of opinion as to the advisability of operation in so-called "latent" gall-stone cases, but the term "latent" gall-stone is fast falling into disuse, since we now know that a gall-stone is evidence of obstruction and infection. "Every gall-stone is a tomb-stone erected to the evil memory of the germs that lie dead within it" (Moynihan); and the patient with gall-stones is very apt, sooner or later, to become aware of having what Carlyle, in his own case, termed an "infernal machine" inside of him.

If gall-stones confined their ravages to the gall-bladder, the let-alone policy might be permissible; but we now know that gall-stone infection may cause sepsis, liver, kidney and heart disease, and various other diseases from infection and interference with assimilation; the same treatment of early operation in appendicitis should also obtain when gall-stones are present, *i.e.* early operation, and the earlier, the better for both patient and surgeon.

The gall-bladder is, in many respects, like the appendix—both are hollow organs lined with mucous membrane, and in both, infection and obstruction may result in all grades of inflammation, simple, catarrhal, suppurative or gangrenous. The danger from early operation is so remote that it is not to be compared with the danger of the disease itself. We should never forget that while operation in advanced cases of gall-stone disease may remove the source of the trouble—the gall-stone—the many and various evil results of gall-stone disease, as enumerated above, are not cured by operation.

There is a phase of gall-stone disease, and also of chronic appendicitis, that appeals to every surgeon—that is, the neurasthenic side of these diseases, for it frequently happens that the patient with these diseases is told that he has neurasthenia, and is advised to try to forget it. It falls to the lot of every surgeon to cure neurasthenia by removing these faulty organs. Another strong argument for early operation in gall-stone disease is the consideration of the welfare of the surgeon himself, since there is no class of cases so productive of worry to the surgeon as is the class of gall-stone disease with various disasters that may attend operations in late gall-stone cases, because of the lowered resistance in these cases.

PELVIC CASES.

No surgical procedure has undergone a greater change of late years than the conduct of cases of Neisser infection of the female genitalia. Formerly, and not so very long ago, the acutely infected tubes and ovaries, and frequently the uterus, were excised without hesitation; but no surgeon advised or practised the removal of the corresponding organs in the male when similarly affected! When it was found that acute adnexitis in women, of Neisser origin, as a rule, subsided without interference, then surgical treatment of this disease became the exception; and today, as a rule, radical operation is not done in acute Neisser pelvic infection. If after a reasonable period, the patient is incapacitated by reason of the results of this disease, then proper surgical methods may be indicated. The ill-timed radical excision of the genital organs in the female that obtained in the past—unsexing, multilating, precipitating severe nervous phenomena, and at times, destroying life—can not be looked upon now other than as a *"bête noire"* of pelvic surgery.

Our present day treatment of certain other affections in women may, however, partly atone for this, since now surgery plays a prominent part in the management of some obstetrical difficulties, especially, placenta praevia, puerperal eclampsia and narrow pelvis.

Caesarian section when done under proper auspices, and when rationally indicated in such cases, exemplifies the highest type of conservative surgery. In properly selected cases of placenta praevia and narrow pelvis, a Caesarian section gives two lives instead of one, and frequently, two lives instead of two deaths. Caesarian section may be much safer for mother and child than is a difficult high forceps in a narrow pelvis, or in uncontrollable bleeding in placenta praevia.

A discussion of pelvic surgery would be incomplete without reference to the "Schauta-Wertheim" operation for complete prolapse of the uterus. This operation is wholly carried out through the vagina; the uterus is interposed between the anterior vaginal wall and the bladder, thus fixing the uterus so that it cannot further prolapse; the bladder is supported by the underlying uterus, and lifted into the abdominal cavity, and the relaxed outlet is properly repaired.

In most cases of prolapse of the womb, this operation is the most rational and effective, and it carries but little risk. It is now the operation most frequently done, and has replaced the old irrational, generally ineffective, and frequently mutilating abdominal operation for prolapse.

CANCER AND ULCER OF THE STOMACH.

We are appreciating, more and more, that it requires an all-around knowledge of the whole man properly to diagnose stomach disease. The stomach is frequently the spokesman for the ills of its neighbors. Less than 10% of people who complain of stomach trouble have, in reality, a disease of the stomach. Good surgical results in stomach disease depend upon a good diagnosis. The history of the patient is still the most important thing in making a diagnosis, and the x-ray examination is indispensable in both cancer and ulcer cases.

There is no question that some of the stomach surgery done in past years has been not only useless, but harmful, and the trouble generally has been in the improper selection of cases for operation. Operation on the stomach may be harmful when the lesion is in other organs, such as the appendix, or gall-bladder, or when the lesion of the stomach, such as ptosis, may contraindicate certain operations such as gastro-enterostomy. No operation in surgery gives a more gratifying result to both patient and surgeon than an operation for a properly selected case of gastric or duodenal ulcer, and delay in operation in such cases frequently means suffering, incapacity and at times death to the patient.

The stomach is a very fertile field for cancer; almost one-third of all cancers of the human body occur in the stomach; and cancer of the stomach treated by other than surgical methods results in 100% mortality. Hence, many cases of cancer of the stomach in the early stages should be given the benefit of surgical treatment just as much as when the cancer exists elsewhere in the body. We are realizing, more and more, that many of the defects of the stomach are of mechanical origin causing stasis, and that the cure is only mechanical. Even the so-called catarrh of the stomach is frequently symptomatic of a mechanical impairment. The study of the motility of the stomach is now rightly regarded as of the highest importance in diagnosis and treatment.

ANESTHETICS.

No discussion of present day problems would be complete without reference to anesthetics. Despite the claims put forward by champions of various other anesthetics, the anesthetic most generally accepted, both here and abroad, as a safe and sane anesthetic, is ether, given to us by a native of Worcester County—Morton.

While the chemical ether remains the same, the method of giving it has improved. Now, the open drop method is not only safer, but in every way more comfortable for the patient. Bevan, in an article, "The Choice of Technique of the Anesthetic,"[12] admirably sums up his study of various anesthetics. "Ether, by the open-drop method, is the safest general anesthetic known for producing prolonged anesthesia. It should be today the standard anesthetic in the surgical clinic. The discomfort of ether anesthesia, when properly given by the open-drop method by an expert, can usually be practically eliminated. The closed method of giving ether is not so satisfactory or so safe as the open-drop method. Complicated apparatus to control the percentage of ether, and to warm ether, possess no advantage over the simple drop method, and should be discarded. The giving of ether by the drop method is an art which must be acquired under the instruction of an expert."

In this paper, I have purposely refrained from a discussion of methods concerning surgical technique, inasmuch as our Society is composed mostly of physicians; and then, too, there have been no startling advances in abdominal surgical technique the past few years. Even now, the operation of choice in pylorectomy and partial gastrectomy is the one first successfully done by Billroth in 1881.

In 1881, also, the first gastroenterostomy was done by Wölfler at the suggestion of his assistant, Nicalodoni. (The first gastroenterostomy, to be sure, was an anterior one). Again, in 1881, Rydygier operated for the first time on gastric ulcer. The technique of cholecystectomy, of intestinal anastomosis, of hysterectomy, of salpingo-oöphorectomy, of Caesarian section, has not changed materially of late years, and Bassini's operation for inguinal hernia, first done in 1885, is still the operation of choice for hernia. But while there have been no very startling advances in abdominal surgical technique in the past few years, the surgical results, in general, of today, are far better than they were previously. We have learned by the mistakes of our predecessors. Many useless operations have been tried and found wanting.

Abdominal surgery is settling down and becoming more conservative where conservatism is called for, and more radical where thoroughness is indicated. *"Qui bene diagnoscit, bene curat,"* applies equally to the surgeon and to the physician; and the physician now, with all the diagnostic aids at his command, helps the surgeon more than ever in the proper selection of surgical cases. The follow-up system in surgical cases, so widely and rightly advocated, will not be so difficult in the doing when both the physician and surgeon put in the suitable time and study in the go-before methods of diagnosis.

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Original Articles.

THE CARNIVOROUS AND HERBIVOROUS TYPES IN MAN: A REPLY TO DR. HOOTON.

BY JOHN BRYANT, M.D., BOSTON.

THE writer being personally and solely responsible for the application of the words "carnivorous" and "herbivorous" as used to describe two very obvious types of human development, Treves[22] having used these words only in connection with the lower animals, Dr. Hooton's recent article[12] in this JOURNAL takes on somewhat of a personal character.

Dr. Hooton objects, first, to the use of the term "herbivorous." If to Dr. Hooton's mind the word herbivorous conveys the idea of "grass eater" rather than vegetarian, it is suggested that he consult the Century Dictionary or some standard medical dictionary.

The terms carnivorous and herbivorous were chosen after due consideration to signify the two types which have been described as existing in the human, for two reasons: First, although not ultra-scientific, they are descriptive and call to most minds a definite mental picture of a complete organism; secondly, diet is about as near as we can get to fundamentals in the living, since without food we die, and it is more to variations in diet in the young than to any other one factor, except perhaps heredity, that type differences in the adult are due. It is obvious that the recognition of type is a means rather than an end, and equally obvious that recognition is far from infallible; but one cannot work much with type without more and more realizing that it is a valuable aid in the diagnosis and treatment of disease,—disease not as the anthropologist knows it upon the dusty bones of his averages, but as the medical man finds it in the living tissues of his individual patient.

Herein lies one of Dr. Hooton's fundamental misconceptions. If his paper is representative, the points of view of the anthropologist and the physician are irreconcilably at variance. The former is essentially a socialist, constantly engaged in reducing the individual to the one deadly level of a mediocre average for a race. This pessimistic and depressing method would deny the existence of a genius. Modern medicine, on the other hand, is constantly becoming more and more individualistic, hoping by the conservation of a genius to add occasionally to the progress of the mediocre mass with which anthropology appears chiefly to concern itself. The anthropological unit appears to be a race. The unit of type is the individual. Thus the study of type is at once more specialized and yet more broad than the study of anthropology. On the one hand, race and ancestry seem paramount. On the other, race and ancestry are of only passing and theoretic interest. The concern of type is with the healthy or sick but living individual, within the race or of all races. The living patient is the problem of today, not of yesterday or of tomorrow. Whereas both types occur in every race, it is yet possible to compare individuals of a given type in several races.

Two practical illustrations of the application of observations upon type variations will perhaps suffice. The figures in both cases are from unpublished preliminary investigations, and quoted through the personal courtesy of Dr. Lewis,[13] and Dr. Hodskins.[11]

Dr. Lewis examined over 500 school children in Worcester. Their ages varied from 12 to 16, with the majority at 14. For the total number, disregarding race, the disposition of the types was in the proportion of two carnivores to one herbivore, as follows:*

Normal	10%
Herbivorous	30%
Carnivorous	60%

About 75% of these 500 boys belonged to but four races. This 75% was found to divide as follows:

	TYPE		
Nationality	Normal	Herbivorous	Carnivorous
American	5%	10%	20%
Swedish	1	7	8
Irish	1	4	8
Hebrew	1	2	6

Abbreviating carnivorous and herbivorous to C, and H, it will be seen that for the three races, American, Irish and Hebrew, leaving out the normals, the ratio is C : H :: 2 : 1; but the Swedish ratio is very nearly C : H :: 1 : 1. In other words, the fact that the Swedish ratio is very different from that of the first three races mentioned is lost sight of if one merely takes the total number of boys and uses the average thus obtained, which is C : H :: 2 : 1. This is entirely parallel to what happens when the anthropologist uses his "mean" for a given race. The variants on either side of the "mean" cease to exist.

The second example illustrates the use of type as applied to the study of a given disease, in this case regardless of race. Dr. Hodskins, at the Monson State Hospital, examined 115 epileptic children. In round numbers, about 55% were so-called normal, but on either side of this group there were found 5% H, and 40% C, or eight carnivores for every herbivore. This is certainly a strong leaning toward the carnivorous side of the scale, and supports my prediction to Dr. Hodskins that epilepsy, especially the idiopathic variety, would be found to occur largely among the carnivores. Additional support is gained by the study of the etiology in these cases, the majority of which were between 10 and 14 years of age. For convenience, the eight herbivores were grouped with the 60 normals, and then compared with the 47 carnivores, as follows:

* Note that only 10% of these 500 boys fall within the limits of the classical or text-book normal.

Etiology	Carnivorous	Normal
Idiopathic	22=50%	4= 5%
Indigestion	17=30%	7=10%
Organic (other)	8=20%	49=85%

No attempt is made to express the percentages with great accuracy, because there is certainly a possibility of error of 5% or so in the determination of type itself, at the present time. But even so, the figures are striking. For idiopathetic epilepsy, the ratio is C10 : N1, for indigestion C3 : N1, but for all other organic causes the ratio is reversed to C1 : N4. In short, idiopathy and indigestion account for 80% of the carnivores, but for only 15% of the normals or herbivores. Conversely, various organic causes account for only 20% of the carnivores, but for 85% of the normal and herbivorous group. These observations are in line with a recent report[17] showing 100% of ptoses and gastro-intestinal disturbances in a series of idiopathic epileptics. It will be observed that age is mentioned in both these examples. It has seemed almost too obvious that in considering type one must have in mind not only age (and also physiological age in children), but such self-evident factors as sex, height, nutrition and disease.

Dr. Hooton has elected to act the medical critic. I certainly should not venture to argue with him on subjects anthropological, but he has seen fit to deny the very existence of type. Since Dr. Hooton's attitude toward type is shared by others than himself, it seems necessary to give in some detail the support upon which rests the theorem of type. With its beginnings lost in antiquity, it found perhaps its first permanent though unconscious record in the drawings of the cave men, estimated as 25,000 years old. These artists[15] always represented the women as corpulent, but the men as lithe, muscular and athletic. Much later, but yet 2,000 years ago, Asclepiades[9] used the words "sthenic" and "asthenic" to distinguish contrasting bodily types, and Caesar[16], shortly afterward, (200 years or so) remarked upon the mental qualities of the fat men who slept at night and of those other restless individuals with their "lean and hungry faces," whom he preferred* not to have too near him. In art one may contrast, for example, the ideals of female beauty portrayed by Botticelli and Rubens. Almost 300 years ago Spigelius[19] had turned his attention to the length of the intestine in its relation to body length, and had recorded a ratio which in a general way holds good today. In 1881, Tarenetzky[21] noted that certain diseases were most frequent with definite lengths of intestine, and two years ago Stern[20], for example, mentioned a considerable list of diseases which he found associated with the asthenic (carnivorous) and the sthenic (herbivorous) types; anyone who takes the trouble can find a vast array of disconnected data bearing on the subject, which was written between these dates, and much more has appeared since 1914.

Dr. Hooton's second fundamental misconception is due to apparent ignorance of the existence of this cumulative mass of evidence, especially as it concerns two very vital phases of bodily activity in the living. I refer to the intestinal tract, and to the group of so-called ductless glands. The complaint is made that I have offered "no statistics proving a correlation between short intestines, high stature, and bodily thinness." In two of my previous papers may be found not only data from my own work,[4] but, in the form of a bibliography[5] of some five hundred titles, a small fragment of the evidence sought. A larger fragment has been easily collected in the form of a card index which already contains over 6,000 titles bearing upon various aspects of the problem. Familiarity with the activities and interactivities of the ductless glands is almost a *sine qua non* for the study of type, or for that matter, any other phase of modern medicine. Leaving entirely out of consideration my own work, Dr. Hooton can find by turning to only three[3, 8, 18] of the many books upon this subject, at least 3,000 references of considerable interest. Were he better acquainted with this information, he might perhaps be less dogmatic in denying a possible correlation between type and sex. To put the value of studying medical literature in a nutshell, the following sentences from the introduction of one of the three books just referred to are quoted: "The present unsatisfactory condition of medicine is due to the fact that investigators do not avail themselves of the enormous array of solid data available, to ascertain the truth. Blinded by the fallacious idea that the worth of a contribution to our knowledge should be gauged solely by the new experiments and clinical observations it adds to those already available, they lose sight of the fact that such experiments and observations are but bricks and mortar out of which a coherent and truly useful medicine—one indeed worthy of ranking as a science—can be built."[18]

In addition to referring to preparation through study of the literature, it seems necessary to refer to the clinical and other preparation upon which is based the theorem of type. First, vacation and other travels have given opportunity for observation of the following peoples in their own lands: The Nascaupee Indians and Esquimaux of northern Labrador, the natives of Newfoundland, Nova Scotia, New Brunswick and Prince Edward Island, Canadians east of Montreal, Americans from Eastport, Maine, to Washington, D. C., and from New York to San Francisco, the Irish, Welsh, and English, the French, Swiss and Italians, the Dutch and the Danes, the Germans, Austrians and Hungarians, the Egyptians and Arabs, na-

* Plutarch records the following as Caesar's original words: "..... As for those fat men and smooth-combed heads, I never reckon of them; but these pale-visaged and carrion lean people, I fear them most....." Shakespeare (Julius Caesar, Act I), in his later and more polite paraphrase of Plutarch has given a vivid description of the contrasting types.

tives of Ceylon, the Malay states and Java, of China and Japan and of Hawaii. This assortment of peoples is doubtless limited, but it contains representatives from the East and the West, and from the equator well northward toward the land of perpetual snow. Secondly, five years of study have led to present medical conclusions. Many of the larger clinical centres in this country and Europe have been visited, and during two years passed in Europe, particular attention was paid to post mortem work. A total of some 500 sections were examined, varying in age from the foetus of 12 cm. to the adult of 90 years or over. In addition, it has been a privilege to have obtained direct information of great value from many of the foremost clinicians on both sides of the Atlantic. Regardless of other possible criticism, therefore, it can hardly be maintained that the theory of type has been presented hastily and without due consideration.

For the sake of brevity, in direct reply to Dr. Hooton, reference will be made to his article according to the serial number of its paragraphs.

I. One can come nearer to a diagnosis than might be imagined, by inspection and elimination.

II. "Granted that there are tall men and short men, lean men and fat men, and that if we divide men on the basis of these two dimensions it will be found that the short, fat men are more liable to apoplexy, and the tall, lanky men to pulmonary diseases." To admit this is in itself to go almost the whole distance in admitting the existence of type.

It is utterly absurd to state that the classification is "based on one or two anatomical characters." The disputed classification itself contains several pages of differences between the types.

III. The establishment of an "anthropological type" had not occurred to me, but at least one anthropological worker[1] has for the past ten years been attempting to prove that one can recognize such types, regardless of race.

IV. It is certain that Dr. Hooton's anthropological method would smother any attempt to prove the types, but it is already admitted that "short, fat men" and "tall, lanky men" are liable to different diseases. It is inconsistent to start a proof with figures on the "Belgians" and to continue it on the "Europeans," but even these mixed figures admit that after ten years of age women are consistently heavier for height than men. This also supports the relation of type and sex. Why? because, for example, the general statement that fatness and hypothyroidism, thinness and hyperthyroidism are concomitant, finds ample support in the literature.

V. Humanity in the mass does change its type, to a certain extent, during life. But at given ages it will be found that different individuals change to different degrees. Puberty, for example, comes earlier in the carnivore than in the herbivore, regardless of race or distance from the equator. I certainly have not left out of my "calculations the changes in body form due to age." It is altogether too elementary and obvious a proposition. Likewise, it is very definitely known "to what extent the length of the gut may vary in its absolute and relative size during the lifetime of the individual." Plenty of references will be found in the bibliography[5] above mentioned.

VI. It is difficult to see why "the illustration of the Indians is particularly unfortunate," unless Dr. Hooton has in mind barnyard or reservation Indians. In former, and for them better days, the braves had no time to wait on the warpath or upon the hunt for corn to grow. The squaws grew the corn at home and did the heavy chores, while the braves covered the country on the run and subsisted upon the game they could kill. The men had to be long and thin or they couldn't stand the pace. In northern Labrador dwell a small remnant of original Americans who yet subsist by hunting, to whom bread and salt are strange, and who depend not upon firearms but upon the spear for killing caribou and upon the wooden hook for catching fish. They live on the country or cease to live at all. This is the variety of the Indian to which I referred, and their outward characteristics as to contrast in body form of the sexes are those represented 25,000 years ago by the artists of the cave-dwellers. It is interesting to remember in this connection that it is only a step from the ideal of female beauty of the prehistoric cave man to the present-day ideal of beauty of the Circassian, whose recumbent Venus must be possessed of sufficient adiposity to make possible the containance of at least an ounce of oil in the umbilicus.

VIII. Figures for races befog the issue. They are of no value for present purposes.

XI. Pigmentation often is excessive in the carnivore. But it is usually of pathologic origin, due often to intestinal conditions which prevent proper excretion and the retention of toxic waste products in the organism. Normal pigmentation is a different matter and perhaps largely a matter of racial characteristics aside from the present issue.

XII. "Of course there may be many individuals with the physical and physiological characters described." It is admitted, then, that type may exist. I never asserted that it was a racial or ethnic affair. Obviously it is not, but the two types occur in almost every race.

XIII. Prominent cheekbones certainly are correlated in the living with a narrow face, close-set eyes, and an aquiline nose. This has nothing to do with skeletal arrangements, but is dependent upon the fact that the face is typically "lean and hungry" looking. The nearest example at hand, of this fact, is an illustration in the Sun-

day paper.[10] Allen of Alaska has just delivered to Capt. Haas of the French army a shipment of his Alaskan dogs. Racially different, the similarity of contour of these two keen faces is striking. To this same type belong Wilbur Wright and Marconi, Lincoln, Emerson, Gladstone and Voltaire, the present rulers of Spain, Serbia, Montenegro, Bulgaria, Germany, Denmark, Sweden, Norway, England and Russia, the Duke of the Abruzzi, Garibaldi, Michael Angelo, Leonardo de Vinci, and many other celebrities who have lived before and after Julius Caesar, not to mention Vesalius, Tuffier, Garré and other well-known medical men. The few chieftains whom I have seen among the northern Labrador Esquimaux are as different in appearance from the others of their tribe as is the Mikado from his peasants. These chiefs are almost a head taller than their people, and their faces are thin, with finely chiselled features. The ordinary modern Esquimaux is a sedentary and lazy individual who will not work when he can avoid it; he is very fond of blubber, which is fattening, and one of his greatest delicacies, according to Dr. John Little[14], is the partly digested moss from the stomach of freshly killed caribou.

XIV. "Microcephaly is certainly rare and generally implies idiocy. Microcephalic idiots are generally far below normal stature." Entirely correct. The only ones I have seen have been idiots in insane asylums, but most of them seemed to be of carnivorous type despite their small stature, which, as previously stated, means nothing definite in regard to type. The carnivorous type is commonly tall, but may occur in miniature at almost any height.

XVII. Bean[2] has been devoting some time to writings which tend to prove that type and ears do correspond. His hyper- and meso-ontomorph types are my carnivores and herbivores. It is also my observation that there is a certain correlation between type and the form of the ear.

XVIII. "Hypertrophic arthritis" is known to be very frequent on the bones of all ancient races. They were, aside from disease, more liable than moderns to trauma of all sorts. In the living, this nomenclature is reserved for a somewhat definite clinical entity.

XIX. Is there then no difference between "goitre" and "exophthalmic goitre"? It is well understood that men wishing to avoid military service in the region mentioned, drink the waters of known localities for a month or two, acquire a goitre, get their release from duty, cease drinking the given water, and within two months more have recovered their previous state of health. They would scarcely be so casual were they to face the danger of acquiring the exophthalmic variety of goitre.

XXIV. Of course the carnivorous type is not increasing in Europe. The Roundheads remained in England. The Puritans left for America, and the carnivores have been leaving England ever since. They prefer a new country where restrictions are fewer, and freedom and opportunity are more abundant. Figures are given in this article to show that the carnivore does predominate in this commonwealth.

XXVI. My remark concerning latitude and diet is obviously a generalization, and therefore open to exceptions, but it is believed that in general it does hold true. Cannibalism is now frowned upon. It was once pretty frequent, and even now one may read well authenticated accounts of shipwrecks or disasters from which the survivors escaped by virtue of subsisting on those who were less fitted to withstand the exposure than themselves. Certain primitive tribes still enjoy the odor and taste of human flesh. It is not impossible that boiling victims in oil and the burning alive of martyrs, witches and others, may be an atavistic expression of cannibalism. In short, a desire for meat seems universal to man, but, on account of various obstacles, the majority of the billion or more inhabitants of this earth have to do without it, much of the time. The desire for fats and carbohydrates is also universal, though also varying in practice with local conditions. Thus different races have their own specialties in the way of fats and oils. As for carbohydrates, even the Nascaupee Indian, essentially a pure carnivore, when starting out for a day's hunt, takes as sustenance only a cup of water into which he stirs a handful of "uinastikai." This substance is prepared chiefly from caribou blood, and the partly digested moss from the stomach of the caribou. In this connection, Cabot[7] says, "It is probable that the slightly digested moss which enters into the uinastikai appeals to our natural desire, seldom gratified in the northern life, for starchy food."

XXVII. Granted that some meat eaters do exist near the equator, even then it has no effect on the general theory of type. But in his attempt to prove the contrary, Dr. Hooton has provided a beautiful example of correlation between diet and type. The efficacy of the tropical jungle may have some local effect in varying the intensity of the action of the sun, but in this case it is, at least, a matter of very secondary importance. One need not look beyond the diet for an explanation of the fact that "the full-grown Masai of pure blood is generally six feet in height at the age of 16, though at that time he is often a spindly and cumbersome and ungraceful hobbledehoy. Three years, however, of an exclusive diet of milk, blood, and half-raw beefsteaks, combined with a rigorous training in warlike and athletic exercises, have developed him into a sinewy and muscular man." This is precisely what is to be expected of such a diet.

XXVIII. It is a pleasure to express my gratitude to Dr. Hooton for his calling attention to two misprints and one error in arrangement, existing in a paragraph containing the reference to Treves, which he quotes. "Animals" should read "Mammals," "Insects" should read "In-

sectivora;" the passage[6a] should read: "through the insectivora and cheiroptera to the monotremes." Treves only infers that perhaps the amphibians come below the monotremes, so all reference to the amphibians is best omitted. With these corrections, the passage is again presented. I did not originate it. It has been available for thirty years, and complaints should be made to its originator. If it is incorrect, there has certainly been time for revision. In this connection, it is sincerely to be hoped that the general theory of type, and in particular the provisional classification, will be subjected to further criticism. Although it is believed that the general theory will stand, it is entirely probable that details must be revised. Any valid corrections offered will be accepted with thanks, and acknowledged with gratitude.

XXIX. It is to be deplored that Dr. Hooton should draw such a peculiar inference. It certainly had not occurred to me.

XXX. Dr. Hooton would be conferring a favor if he would state his "other reasons" why he "cannot believe in the existence of" the carnivorous and herbivorous types of man. As has been previously remarked, his anthropologic method would certainly never reveal the existence of type even if there were a doubt of its existence, which, fortunately, there is not. One word of caution is necessary. In working with type, it is difficult to do much in infancy or before five to seven years of age. Internally, intestinal and ductless glandular variations may be demonstrated even early in the foetus, but outwardly, all infants have much the same body form.

In conclusion, it may be stated that Dr. Hooton's objections do not appear to be sufficient to overthrow the theory of type which has been presented. To reverse his parting words: I think I do not go too far when I say I feel assured that if students preparing for an anthropological course were thoroughly grounded in medicine, it would very greatly enlarge their field of vision in their later professional career, and that such a preliminary training would result not only in invaluable contributions to medicine by members of the anthropological profession, but would also be instrumental in the advancement of medical science.

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CONCERNING THE RAISON D'ÊTRE OF THE TERM "INVOLUTIONAL" AS APPLIED TO MELANCHOLIA.*

BY J. W. COURTNEY, M.D., BOSTON.

THERE is probably no easier way out of the subtle and complex problem of causation in mental disorders than to ascribe to certain epochs in human life,—puberty, adolescence and the climacteric, for example—consequent organic upheavals in circulation, in ductless glands or in any other component part of the economy to which fancy may lead the attention of the individual observer, to make these upheavals responsible for whatever mental aberrations may occur in the given epoch and to attach to these aberrations names suggested by the epoch. Such a procedure may, superficially at least, satisfy the demand for differentiation which obtains in clinical psychiatry. But is it ever warranted by close observation of clinical and pathologic facts?

A complete answer to this comprehensive question the writer will not venture to attempt, but will confine himself strictly to the case of so-called involutional melancholia and endeavor to set forth valid reasons for believing, as he does, that the term is purely one of convenience and one without the slightest *raison d'être* from a descriptive, a pathologic or a differential standpoint.

According to the well-known views of Kraepelin, melancholia occupies the foremost place in, and is the most typical of, the group of psychoses which he believes to stand in direct causal relationship to *general* involutional changes. Furthermore, he extends it to embrace all pathologic anxiety-depressions of the last half of life, which do not represent episodes in other forms of mental disease.

According to the same observer, the age of onset varies between forty and sixty-five years, and the incidence of the disorder, as regards sex, is 60% among women as against 50% among men. It is also his idea that melancholia probably represents a pathologically intensified expression of the growing feeling of incapacity and inefficiency natural to advanced years as opposed to the consciousness of superabundant vigor which obtains in youth.

The excuse for exploiting these Kraepelinian views, familiar to you all, is that they furnish an integral part of the basis of the argument to follow. First of all, it is difficult for the writer

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to bring into harmony with logic the notion that melancholia stands in intimate causal relationship with general involutional changes in the organism. It is to him absolutely inconceivable that, in the absence of all other causes, the state of organic involution which normally obtains at the age of forty is capable of producing a mental disorder in nowise distinguishable clinically from that produced by the same agent at the age of sixty-five. In the case of women it might be argued that the climacteric, commonly alleged as a causative factor of tremendous moment, outweighs in involutional importance anything indicative of natural organic decadence in the sixth decade. But there is more than one insuperable objection to such argument. First, that the number of female melancholics exceeds that of male by only 10%; second, that in many cases melancholia makes its appearance either several years before or many years after climacteric changes begin to manifest themselves; and third, that both pregnancy and lactation are not so very infrequently accompanied by a complex of morbid mental symptoms in no essential respects different from that which is supposed to be pathognomonic of the mental disorder under consideration. Here, also, two other facts irreconcilable with the Kraeplin theory are not out of place. One is to the effect that melancholia is recoverable, both at forty and sixty-five under forms of treatment which do not at all possess the specific property of arresting involutional changes; the other brings us face to face with a state of affairs that transcends the merely paradoxical—namely, that many cases of irrecoverable *involutional* melancholia terminate in a mental state indistinguishable from that which we are pleased to consider the product of disordered evolution and which we call *dementia precox*.

No one who surveys critically the field of mental disorders can possibly fail to appreciate the fact that while there are striking differences among these disorders with respect to duration, termination and, possibly, also pathology, there are too many clinical expressions of prime importance common to all to permit of the conclusion that such a state of affairs is merely fortuitous. If we give any heed at all to the law of cause and effect we must at once admit that identity of effect signifies identity of cause, and this single fact should restrain us from attempting too sharp differentiations in clinical psychiatry.

It is interesting to note that the same situation obtains as regards causation in disorders of the body politic, and we might with profit apply in our appreciation of mental disturbances the wisdom contained in the following words of Montesquieu regarding disorders of state. "There are," he says, "general causes, moral and physical, which act in each state, elevate it, maintain it, or cast it down; every accident is submitted to these causes, and if the fortune of a battle, that is to say a particular cause, has ruined a state, there was a general cause which brought it about that that state had to perish by a single battle."

To the present writer's way of thinking, the above utterances have a peculiar applicability, particularly with respect to the matter of general causes, in so-called involutional melancholia. And in this category heredity seems logically to hold the foremost place. Kraepelin states, on the contrary, that the causal importance of heredity is quite insignificant as compared with acquired disposition, and bases this statement on the fact that in only 53% of his patients whose antecedents could be accurately determined did he find any evidence—and that often remote—of a family predisposition to the disorder under consideration. He admits, however, that the difficulties in obtaining exact information concerning parents and the brothers and sisters of the same were, in the older patients particularly, manifold.

These dificulties are keenly appreciated by all of us. In very many cases we feel morally certain that the fact of the existence of insanity in the patient's forebears—whether immediate or remote—is intentionally concealed from us by his near relatives. In many others no reliable information is obtainable on this point, even where no attempt is made by those concerned to obscure the truth. I personally feel that if the whole truth could be known, it would at once appear that practically every victim of involutional melancholia is the possessor of the insane diathesis. Be this as it may, the fact that Kraepelin finds some evidence of ancestral insanity in more than half of his melancholics serves notably in making heredity share with involution the burden of causative responsibility.

The importance of establishing heredity as a strong causal factor becomes manifest when we examine Kraepelin's notion concerning the pathology of involutional melancholia as expressed in his statement, already quoted, to the effect that it probably represents a pathologically intensified expression of the constantly growing feeling of incapacity and inefficiency natural to advanced years—in other words, that the disorder is a dynamic one. This conception immediately puts the involutional melancholic in the same category with the neurasthenic, the psychasthenic and the hysteric, whose fundamental disorder is a dynamic one and one, furthermore, mainly of congenital origin.

It now remains to be shown that the assignment of melancholia to the same pathologic class with neurasthenia, psychasthenia and hysteria is not a purely arbitrary one. Nobody will deny that the symtomatology of all three of the disorders just mentioned is strikingly identical in the bulk of its major aspects. Now, if we continue the process of comparison and range the symptoms of psychasthenia with those of involutional melancholia, we find on careful analysis that melancholia is nothing more than psychas-

thenia with the barriers of inhibition swept away.

The melancholic's delusions represent nothing more than an intensification of the psychasthenic's obsessions of sacrilege, of crime, of disease, of shame of self and shame of the body; the phobias of both—the most characteristic expression of the adynamic state to be found in symptomatology—are absolutely identical, both in kind and degree; their crises of agitation and anxiety show no noteworthy points of dissimilarity; their tics, their *folies du doute* are the same; the same manias of oscillation, interrogation and omens are found in both,—indeed, this symptomatic parallelism might be extended to the point of wearisomeness. Whatever differences there may exist in symptoms are differences in intensity only. For further examples,—the psychasthenic, actuated by feelings of remorse, shame of self or of the body, desire for expiation or reparation, general sense of unworthiness or what not, has impulses toward self-mutilation or self-destruction, which are never fulfilled, while the melancholic, actuated by motives identical in kind, but of sufficient intensity to annihilate inhibition, really maims or destroys himself. A final and even more striking illustration of the point under consideration is furnished by the feeling of strangeness and depersonalization. It is experienced by the psychasthenic and the melancholic alike, but whereas the former, by constant argumentation succeeds in convincing himself that it is *his* hand with which he performs certain movements, *his* feet which carry him about, *his* voice with which he speaks, the melancholic falls, by the intensity of the above morbid feeling and by the consequent complete loss of inhibition, under the domination of the delusion that the various members of his body are not actually his, that they are not real living parts, that he is, in fact, non-existent; and he finally carries his notions of nihilism to the point where they embrace all the phenomena of the universe.

The query now arises: Are involutional processes the factor responsible for the intensification of morbid feelings which transforms psychasthenia into melancholia?

That the answer must be in the negative is determined by several facts, two of which are most conclusive: The first comes from the march of events in certain cases in adolescents where the symptom-complex is at the outset that of psychasthenia and the terminal stage a dementia, called precox, which has no demonstrable connection with general involutional processes, yet is indistinguishable from one terminal stage of the disease designated, under present usage, as involutional melancholia; the second is drawn from the observation of depressed states identical with so-called involutional melancholia, which make their appearance during the flood-tide of mental and physical vigor, run their course and recover, and which may even recur and again recover several times over before involution processes in the economy have fairly started.

On the strength of all the facts adduced, the writer ventures to contend that the term *involutional* not only adds nothing to our understanding of the disease melancholia, but that it is positively misleading from the standpoint of pathology—hence, should be discarded.

BACTERIOLOGICAL WORK AT THE AMERICAN AMBULANCE.*

BY ORVILLE F. ROGERS, JR., M.D., BOSTON,
AND
GEORGE BENET, M.D., BOSTON.

THE following report is based upon the bacteriological work which was done as a part of the Harvard University Service of the American Ambulance, from April 1 to July 1, 1915.

There was an excellent general pathological and bacteriological service organized and well equipped, as one of the sub-departments of the institution, under Dr. Joblons, when the Harvard Service came on duty, April 1, 1915. After Dr. Joblons' resignation in April, Dr. Kenneth Taylor took charge of the general pathological work, and the writers would here express to these two gentlemen their gratitude and appreciation for the assistance they gave to the Harvard Service in the equipment of its own laboratory, and in the institution of its special work.

Owing to the departure of Dr. Richard P. Strong for Serbia, the Harvard Unit lost the benefit of his continued direction and counsel. The bacteriological work, however, was carried out as nearly as possible in accordance with the plans laid down by him. The work which is here described was outlined by Dr. Strong before his departure for Serbia, but it was a great loss to us that he was unable to remain in Paris and direct it.

Our purpose was to determine, if possible, whether there was more than one strain of gas bacillus causing gas gangrene, and, if so, to study the growth of these bacilli in various sugar media, and try to differentiate them by this means. In addition, we were interested in the relation of the gas infection to the type of missile which had caused the wound, the presence or absence of clinical symptoms, and several other phases of the subject.

Cultures were taken from fresh wounds which showed any discharge. Many of our admissions had no discharge, some were overlooked, and others arrived before the laboratory was fitted for work, with the result that we obtained cultures from 100 different men. One hundred and thirty-two different cultures were taken on these

* Read at a meeting of the Boston Surgical Society on Nov. 1, 1915.

Number.		Plain Agar.	Glucose Agar.	Lactose Agar.	Laevulose Agar.	Maltose Agar.	Mannite Agar.	Inulin Agar.	Nitrate and Glucose Agar.	Morphology and Gram Stain.
1529	Gas	4	4	3	5	3	0	5	3	Large Gram pos. and neg. rods, blunt ends.
	Growth	—	—	—	—	—	3	—	—	
1321	Gas	3	3	2	5	5	1	3	4	Large blunt ended rods both Gram pos. and neg.
	Growth	4	—	2	5	5	1	3	3	
1675	Gas	2	—	—	0	0	3	0	0	Small Gram neg. thin bacillus, one-half size of anthrax.
	Growth	—	—	—	3	3	—	3	3	
1612	Gas	0	—	1	5	4	1	3	4	Short Gram pos. round ended rods. Few ovoid forms.
	Growth	2	—	3	4	4	1	3	3	
1630	Gas	1	—	3	4	5	1	3	3	Large round ended Gram pos. rods.
	Growth	3	—	5	4	5	3	5	5	
1845	Gas	3	—	2	5	5	2	2	4	
	Growth	4	—	3	5	5	3	5	5	
1717	Gas	3	—	2	5	5	2	3	5	
	Growth	5	—	3	5	5	3	5	5	
1016	Gas	2	—	2	1	4	1	1	3	Gram pos. blunt ended rods, size of anthrax.
	Growth	2	—	4	1	5	3	3	5	
1011	Gas	0	—	1	4	4	1	—	3	
	Growth	1	—	4	5	5	3	—	5	
1080	Gas	0	4	0	1	1	4	3	3	
	Growth	1	5	3	3	3	5	3	3	
932	Gas	0	4	0	4	4	1	1	3	
	Growth	1	4	1	5	5	2	3	5	
2019	Gas	2	4	2	3	4	0	0	3	Large Gram pos. bacilli, size of anthrax.
	Growth	1	5	2	5	5	1	1	5	
1071	Gas	1	3	3	1	0	3	3	2	Large square ended Gram pos. bacilli, often in pairs.
	Growth	3	3	5	3	3	5	5	3	
2105	Gas	3	3	1	3	5	3	2	3	Same as 1071, both showing often irregular and bipolar staining.
	Growth	5	5	1	5	5	5	5	5	
Bx.	Gas	2	2	1	—	5	1	2	4	Short, Gram pos. rods with rounded ends, often in short chains.
	Growth	2	3	2	—	4	2	3	4	
2214	Gas	1	5	2	—	3	0	2	5	Rather slender, long bacilli with rounded ends, often in pairs, Gram pos.
	Growth	3	4	2	—	4	2	3	5	
2196	Gas	1	4	0	—	4	1	3	2	Moderate sized, round ended rods, Gram pos., with many central spores.
	Growth	3	4	0	—	4	3	4	3	
1888	Gas	0	4	2	—	4	0	2	3	Moderately long, Gram pos. rods. Spores at ends or middle.
	Growth	3	4	2	—	4	2	3	3	
Averages	Gas	1.5	3.6	1.6	3.3	3.6	1.4	2.2	3.2	
	Growth	2.7	4.1	2.6	4.1	4.4	2.6	3.6	4.1	

cases, as some had multiple injuries and others had cultures repeated. A few cultures of clothing were taken, but that phase of the work was mainly in the hands of another worker, as were the animal experiments, with these organisms.

Our method of procedure, as outlined by Dr. Strong, was as follows: Cultures were taken from the patient on admission, on sterile cotton swabs, and inoculations made in plain bouillon. From this medium re-inoculations were made in plain agar stabs and slants, and glucose agar stabs. Agar plates were made also in some of the cases. The original bouillon culture was then heated to 60 or 70° C. for thirty minutes or more, to kill non-spore-bearing organisms, and re-inoculations made in glucose agar stabs. After twenty-four hours' incubation the growths were examined, and the attempt made to isolate the colonies from such cultures as showed gas production. Rarely pure cultures

were obtained at this stage, but usually it required repeated plating and re-inoculations to accomplish this. When the cultures were obtained pure they were grown anaerobically, by means of pyrogallic acid, on a glucose agar slant, and further inoculations made from this growth. We used the following media: Plain bouillon, glucose bouillon, bouillon Martin, egg bouillon, peptone solution, litmus milk and agar, gelatine, plain agar, and agar to which had been added one of the following sugars: Glucose, lactose, levulose, maltose, mannite, and inulin; also glucose and nitrate media, and potato. These were incubated twenty-four to forty-eight hours and the results recorded. Staining reactions, morphology, motility, etc., were noted.

Of the 100 different men, the cultures from 28 showed gas-producing organisms. However, for one reason or another, we were able to obtain pure cultures of only 18 different organisms to run through the various sugar media.

The amount of growth and gas production was recorded by numbers. The numeral "1" indicated, for example, very slight; "5," very large gas production, with the intermediate numerals for amounts between these extremes. A table was made, using these figures, and the average values of gas production computed for each sugar medium by adding the numbers set down for any one sugar, and dividing by the number of organisms. These average values were then compared with the figures for the individual organisms, and although we had several different strains, we could find no greater variations from the average among these strains than among different individuals of the same strain. The results seemed to show that it is the type of sugar, and not the strain of organism, which dictates the amount of gas production. In short, from our work with the sugar media it appears that they are not suitable as a means of identification or differentiation of the gas-producing bacilli.

While 28 of the men whose wounds were cultured showed the presence of gas bacillus, only 9 of these had any clinical signs of a gas infection, and in 7 of these latter cases there was only slight subcutaneous crepitation, or a few bubbles of gas in the pus, signs which disappeared at once on wide incision. Of the 2 patients who had severe symptoms, one had a very bad gas infection of the leg, and one died of gas bacillus septicemia, following infection of the arm. Both of these cases were clinically developed on arrival at the hospital, and in no instance did a positive culture foretell subsequent trouble from gas infection.

The majority of cultures showed staphylococcus, either alone (30), or with other organisms (58). Forty cultures showed an anaerobic growth of other than gas producers. Other organisms seen were: pneumococcus (11), streptococcus (9), pyocyaneus (5), and varieties of anaerobes other than gas producers (25).

What effect the presence of fragments of cloth or shell in the wound had in relation to the finding of gas bacilli in the cultures, was an interesting question. Out of 7 cases in which cultures were made from the cloth picked from the wounds at operation, 4 showed the presence of gas bacilli, while 3 were negative. In 2 of the positive cases, the pus from the wounds did not show gas organisms.

The type of missile seemed important, for of the 28 cases positive for gas bacilli, the wound was caused by shell fragments in 17, or 61%; by rifle bullet in 7, or 25%; by shrapnel in 3, or 11%; and by mitraille in 1, or 3%. When this is compared with the figures for the total cases, we find that fragments caused only 42% of all the wounds, as against 61% of the gas infections; and rifle bullets 40% of the wounds, and only 25% of the infections. Shrapnel caused 10% of the wounds, and 11% of the infections. The striking thing, then, is the much greater liability of a shell fragment to cause gas infection as compared with a rifle bullet, undoubtedly due to the fact that it is more likely to carry cloth and dirt with it than is the rifle bullet.

The men whose cultures showed gas bacilli averaged to have the same treatment as those who did not. It is not possible to say, either, that the men who showed severe clinical symptoms had any poorer treatment immediately after injury than many who had no symptoms at all.

The question of the utility of baths and recent changes of underclothes as preventatives of gas infections seems to be answered in the negative. The nature of the warfare is such that the uniform is always dirty, and it is from this dirt, undoubtedly, that the infection comes—not from the linen or skin.

The regions vary somewhat as to the prevalence of gas infection in the wounds. This regional difference is shown by the fact that out of 17 cultures from patients from the Ypres region, only 2 showed gas bacilli (12%), while out of 41 from men from Arras, and nearby points, there were 19 positive cultures (46%).

We could form no idea of seasonal changes, for we were there but a short while, and the increase in positive cultures during June may have been due to the increased activity around Arras at that time.

SPINA-BIFIDA.

BY BENJAMIN B. CATES, M.D., KNOXVILLE, TENN.

ON September 26, 1907, I read a paper on Spina-Bifida before the East Tennessee Medical Society in Knoxville, Tennessee, reporting three cases of spina-bifida, which were operated. This paper was published in the BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clviii, No. 5, pp. 154-157, Jan. 30, 1908.

On April 11, 1911, I read another paper on Spina-Bifida before the Tennessee Medical Society at Nashville, Tennessee, reporting four additional cases of spina-bifida. This paper appeared in the BOSTON MEDICAL AND SURGICAL JOURNAL, Vol. clxv, No. 1, pp. 13-15, July 6, 1911.

Since these papers were published, I have operated nine other cases of spina-bifida, which I wish to sketch in this paper as a supplement to the other two papers already reported. I shall not attempt to elaborate on what has gone before (further than to correct a mistake I made in reporting the age of patient No. 7 in the second paper. The report gives the age as 26 years, when it should read 34 years), but content myself with a serial continuation of my papers one and two on Spina-Bifida, reporting the cases seriatim.

CASE 8. Baby S., age, 2 months. Female, white. Referred by Dr. J. M. Cox, Scarboro, Tennessee.

Family History. Father and mother healthy.

Personal History. Was born with a cervical tumor just below the occipital bone. This tumor grew rapidly and at time of operation was size of a hen's egg.

Diagnosis. Meningocele (cervical).

Treatment. March 28, 1912, removed tumor at operation.

Immediate result. Good.

Late result. Baby S. lived and thrived until the following December, when she died of pneumonia.

CASE 9. Baby Y, age, 21 days. Female, white. Referred by Dr. J. Q. A. West, Knoxville, Tennessee.

Family History. Father and mother healthy.

Personal History. Born with a tumor in lumbar region, has paralysis of lower limbs, otherwise normal.

Diagnosis. Meningo-myelocele (interrupta), latter diagnosis made at operation.

Treatment. June 3, 1912. Excised tumor which had two pedicles, which came out of interrupted spinal canal, that is to say, there was a defect of the second lumbar vertebra from which protruded the upper pedicle, then intact third lumbar vertebra, with absence of arch of fourth lumbar vertebra, from which protruded the lower pedicle. Both pedicles were inside a common sac, which, from external appearances, gave no indication of the conditions found at operation.

I removed the sac, replaced nerve elements in the canal, and covered over the defect with fascia turned over from muscles on either side of the defect. The entire posterior osseous part of the sacral canal was absent, but was covered with dense fascia. This I did not disturb.

Result. Baby Y recovered from the operation, the wound healed by first intention, but in one week its head began to enlarge.

July 23, 1912. Has well-developed hydrocephalus and internal strabismus—no motion in lower limbs.

Subsequent History. The parents removed to California with the child, where the child lived without improvement for four or five months and died.

CASE 10. H. R., age 12 years. Male, white. Referred by Dr. C. C. DeArmond, Knoxville, Tennessee.

Family History. Father and mother and one sister living and in good health.

Personal History. Slender, anaemic boy, with rather large head, was born with a tumor over lumbo-sacral region. This tumor grew and became as large as a cocoanut. Four or five weeks before I saw him the sac broke and began discharging cerebro-spinal fluid. It became infected and suppurated three or four weeks. The suppuration seemed to be between the sac proper and the overlaying skin, so I made a free incision through the skin and packed loosely each day. The wound granulated and cicatrized.

June 14, 1912, I removed the tumor, turned in nerve fibres, and covered over the defect (which was 2 inches long and 1 inch wide) with fascia from the erector spinal muscles. The patient rallied from the operation all right, but part of the wound became infected and had to heal by granulation.

For six days the patient lost control of bowels, with anesthesia of buttocks, and inner and back part of upper 1/3 of thighs. A few days after the operation, an eruption appeared on the hands, resembling very much pellagra. For six weeks he could not void urine and had to be catheterized. This set up a cystitis which bothered him for a long time. Now at the present writing (Jan. 1, 1916,) he has trouble in controlling his bladder, as the urine dribbles away.

CASE. 11. Baby McN., age, 6 weeks. Female, white. Referred by Dr. Eva Newell, Knoxville, Tennessee.

Family History. First-born of healthy parents.

Personal History. Has tumor over lower lumbar and upper sacral region, the size of a hen's egg.

Diagnosis. Meningocele.

Treatment. March 29, 1913, removed tumor by operation and covered over defect with fascia from neighboring muscles.

Immediate Result. Good, no complications.

Remote Result. Dec. 14, 1915, I saw Baby McN. She is a bright, chubby little girl full of life, talking and walking everywhere. The site of operation is covered with long hair.

CASE 12. Baby N., age, 41 days. Male, white. Referred by Dr. J. D. Herrell, Powells, Tennessee.

Family History. First-born of healthy parents.

Personal History. Has tumor size of hen's egg in mid-sacral region, also umbilical hernia, otherwise a normal healthy child.

Diagnosis. Meningo-myelocele.

Treatment. April 9. 1913, removed tumor and covered in defect one inch long and one-half inch wide with fascia.

Result. Good.

Present Status. Dec. 15, 1915, good.

CASE 13. Baby D. H., age, 2 months. Female, white. Referred by Dr. J. G. Eblen of Lenoir City, Tennessee.

Family History. Father and mother, one brother and one sister all healthy.

Present History. Born with a tumor in upper cervical region. Tumor was smooth, translucent and glistening over dome.

Diagnosis. Cervical meningocele, operation showed it to be a suboccipital meningocele.

Treatment. June 27, 1913, removed tumor (which had a long pedicle) by operation. The pedicle protruded through a defective development on the posterior border of the foramen magnum. The long stalk to the pedicle allowed the tumor to gravitate into the neck and appear as if there was a defect in one of the cervical vertebrae, when in truth it protruded through the foramen magnum which extended upon the occipital bone for about 1/2 inch.

The pedicle was cut off, sewed with cat gut and the defect covered with fascia from either side. The skin was closed with horse hair.

Result. I went to another town to do the operation and as I never saw the child again, I shall append verbatum without comment Dr. Eblin's (the family physician) report made at my request.

"This child was born April 5, 1913, was operated on June 27, 1913, and died Sept. 2, 1913. The wound after the operation healed by first intention and no evidence of infection. Thirteen days after the operation, a bad train of symptoms developed and lasted until it died.

"The symptoms were about as follows: Temperature running up to 105° in the afternoon, and then it would become normal or almost so in less than 24 hours, and later return again.

"It would draw at times in the muscles of the back and arms, and back of the neck. It vomited frequently and there seemed to be general disturbance of the alimentary canal which I could not correct with diet or medicine."

CASE 14. Baby P., age 4 months. Female, white. Referred by Drs. Penland of Philadelphia, Tennessee, and George of Rockwood, Tennessee.

Family History. Born of healthy parents with a sessile tumor at junction of middle and lower thirds of spine. The tumor was translucent and membranous except at centre which showed a corrugated surface of skin the size of a five-cent piece.

Diagnosis. Meningo-myelocele.

Treatment. Oct. 1, 1913, the tumor was removed by operation. The interior of the sac was plastered all over with nerve fibres which converged to the under surface of button of skin at the dome of the sac. The posterior arches of all the lumbar and lower two dorsal vertebrae were lacking.

I peeled off all the nerve elements from the interior of the sac as far as the button of skin. It seemed impossible to separate the nerve fibres at this point without destroying them, so I shaved off the button of skin down to the sac, turned the mass into the shallow canal, tied off the sac and covered defect and all nerve elements with fascia taken from the erector spinal muscles on either side and turned over, like a trap door.

Result. The baby did finely until the evening of the fifth day, when, without warning, it began having convulsions, and died in convulsions on the following day. Six days after the operation.

CASE 15. Baby M., age, 2 months. Female, white. Referred by Dr. J. L. Proudfoot, Athens, Tennessee.

History. First-born of healthy parents, has large lumbo sacral tumor.

Diagnosis. Meningo-myelocele involving all of sacrum and lower two lumbar vertebrae.

Treatment. March 3, 1915, removed tumor. The inner surface of the sac was covered with the cauda equina.

Replaced cord elements in lumbo- sacral canal and covered canal with fascial flaps taken from the erector spinal muscles and iliac fascia.

Result. Baby recovered from operation and lived 27 days without recovering the use of its lower limbs or controlling its bowels. There was a continuous diarrhea which nothing could control, though at times it seemed as if a few drops of a 2% argyrol given by the mouth several times a day would benefit it for a few hours.

CASE 16. P. W., age 5 years. Female, white. Referred by Dr. J. M. VanderGriff of Halls X Roads, Tennessee.

History. Born of healthy parents with a lumbo-sacral tumor.

Diagnosis. Meningo-myelocele due to lack of development in lower two lumbar and upper sacral vertebrae.

Treatment. April 22, 1915, removed tumor and covered defect with fascia.

Result. She did well for a few days, when she developed meningitis and died on the eighth day following the operation.

This was an especially sad case and it nearly broke my heart to see her die; because she was so patient and wanted to live so much, and was willing to coöperate in any little orders I would give the nurse.

REMARKS.

It will be seen from a study of the sixteen cases I have operated, that the ages of those afflicted with spina-bifida varied within wide limits. The youngest being twenty-one days and the oldest 34 years. The age of the patient is not such an important factor in determining the personal equation as the physical condition. Most of these patients have low vitality and poor resistance, hence are extra hazardous risks. But a most important point, and one that the surgeon may emphasize, is that at some period of such a patient's life, the sac will rupture either as the result of distention and thinning from over-accumulation of cerebro-spinal fluid, or the result of ulceration from trauma with all the dangers of infection. For that reason the surgeon may with a clear conscience urge the lesser of two evils, operation under the most favorable circumstances, rather than rupture with risk of infection and meningitis.

Of my sixteen cases, ten survived beyond a post operative period of three months. Of these ten there died, one four months, and one eight months P.O. of pneumonia, and one six months P.O. of hydrocephalus; seven are living.

To wit: In the first series after nearly eight years, one patient, a boy, had upper sacral tumor, is healthy and growing.

In the second series, after five years, three are living; of these, two are children, one had cervical tumor, is healthy; the other had lumbar tumor, has hydrocephalus and paralysis of lower limbs and obstinate constipation. The third had lumbo-sacral tumor, is 39 years old, a big, stout chauffeur, working every day driving a big automobile.

In the third series, one patient, a boy of fifteen, had lumbo-sacral tumor after three and a half years, is growing and doing fairly well except he cannot control his bladder; one a girl had lumbo-sacral tumor, is doing well after twenty-one months. Another, a male child with meningomyelocele in mid-sacral region, is doing well after twenty months.

NOTES ON THE RECENT EPIDEMIC OF INFLUENZA.

BY JOHN A. CECONI, M.D., BOSTON,

Medical Inspector in Division of Communicable Diseases, Boston Health Department.

AT the suggestion of the Health Commission of Boston, the following observations are made by the writer (a field worker in the Health Department) in twenty-seven cases of various types occurring in the present epidemic of acute infections of the upper respiratory and gastro-intestinal tracts. In the first place, they all came under his own personal observation, and in the second place, the clinical findings in all of these cases were supplemented by a bacteriological study by Dr. George P. Sanborn of the Boston City Hospital, whose results will be embodied in a conjoined report.

Every practitioner of medicine in this community has, of course, been brought in personal relation with many cases similar to those which form the subject matter of this brief study, and it was felt that a statement of the memoranda in these cases, supplemented by the bacteriological findings, might prove interesting, if not instructive, to those whose duties required attendance on such cases.

All of these cases occurred in Greater Boston within the last few weeks, the epidemic apparently reaching here from the Middle West. While it is not believed that the season of the year is in itself directly responsible for these acute respiratory infections, it is generally conceded that the faulty hygiene which obtains during the colder months of the year may well be an indirect etiological factor.

Fifteen of the cases in this series were males; twelve were females. If this permits of any deduction, it will appear that the sex of the patient is of no special significance. Nor would age appear to be respected by the invading organism, since the writer's cases range from fourteen months to forty-six years of age, and numerous cases have been brought to his attention where even those of advanced years have been victims of this epidemic.

The most striking feature of this series of cases was that they had certain characteristics in common. Primarily, the site of infection was in the upper air passages, very often first in the larynx, trachea and naso-pharynx. For example, 70% of all these cases showed infection in the situations named, and 30% showed gastro-intestinal and respiratory symptoms combined.

The incubation period, as far as could be noted, was very brief, being in many instances less than twelve hours, and in others retarded to seventy-two hours.

The mode of onset in every case of this series was abrupt. There were no symptoms which could be definitely classified as prodromal. All the cases now under discussion were prostrated to a greater or less degree; all were confined to bed, although members of the immediate household, to whom the infection in some cases might be traced, were never acutely ill, were always ambulatory types, and might possibly be considered carriers.

The usual history (70% in this series) was as follows:

The patient taken suddenly ill, found in bed, prostrated, complaining of hoarseness, frequent irritating cough, often paroxysmal in character, accompanied by substernal constriction, marked frontal headache, generalized pain, more pronounced in the legs, and the mental state which might, perhaps, be properly described as one of apprehension.

This initial stage was promptly followed by the appearance of profuse muco-purulent expectoration, which was often greenish yellow, tenacious in character, and was associated with a similar nasal discharge, which might occur in both nostrils, but more commonly in one, suggesting the possibility of sinus involvement.

All of these cases showed fever to a greater or less degree (from 100° F. to 104° F.), being subject to marked fluctuation with remission or exacerbation of symptoms.

Physical examination was very often disappointing to a degree; aside from the perfectly obvious discharges and an unmistakable pharyngitis, physical signs were for the most part wanting. Such was the average case.

These cases remained in bed four to six days, soon relieved of the constitutional symptoms, seldom relieved of the cough, nasal discharge and frontal headache.

During subsequent days, there was in many of the cases of this type, such an amelioration of symptoms as to lead one to believe that the illness had terminated, but a recurrence of the fever, nasal discharge, frontal headache, etc., led one to consider a reinfection.

Some few of these respiratory infections showed an extension of the process to the bronchial tubes with a marked increase in the prostration and, in fact, of all the symptoms.

In no case has the writer been able to determine any definite pneumonic consolidation of the lungs, although one case suggests the beginning of a catarrhal pneumonia at this writing.

Mingled with these usual types were cases (30% in this series) in which the predominating

symptoms were gastro-intestinal. These occurred largely in infants. Such a case would give a history as follows:

That some member of the immediate family had had an infection of the upper air passages for some days, and had come into intimate contact with the child now ill; that the child had shown evidences of infection in the eyes, nose and throat, as in the cases previously outlined, without, however, decided constitutional symptoms over a period covering three or four days; following which, the child became acutely ill with persistent vomiting, intense thirst, and a choleriform diarrhea. The prostration was extreme. The patients were pale, the eyes sunken, the tongue heavily coated; the temperature in most cases was low, in many subnormal. The pulse was slow and compressible.

No definite signs could be made out on examination of the abdomen, but a general condition of hyperesthesia seemed to prevail, as all these children cried on any attempt at handling by an attendant.

The dejecta were liquid, frequent, copious, and foul smelling in all cases; contained mucus in most of the cases, and blood in two of this series.

The urine was scanty, high in color, and acid in reaction in most cases. Forty per cent. showed albumin; one specimen showed the presence of acetone.

Accompanying these gastro-intestinal types, there were skin manifestations, both urticarial and erythematous. These rashes, however, were transient.

The striking features of these types of cases were:

1. Persistent vomiting.
2. Intense thirst.
3. Prostration.
4. Subnormal temperature.
5. Slow, small pulse.
6. Moist skin.
7. Choleraic diarrhea.

Such were the types of cases which prevailed largely during this recent epidemic.

CONCLUSIONS.

That these conditions were due to a specific organism in some cases and to mixed infections in others, seemed so clearly indicated that, as stated in the early part of this paper, bacteriological studies of the cases were made by Dr. Sanborn.

Clinically it would appear to be a highly communicable condition, spread by mild ambulatory carriers, increasing in severity as it progressed, sparing neither age nor sex, protean in some of its minor manifestations and conferring on its victims no immediate immunity, since several cases showed evidences of relapse or reinfection.

PROPHYLAXIS (GENERAL).

During epidemics such as the present, overcrowded places, especially stuffy traffic vehicles, should be avoided. Households in which the infection is known to exist should be shunned. Breathing fresh air is an excellent measure against any infection. Over-study and overwork weaken one's resistance. Therefore, recreation of the body and mind together is commendable, as it tends to develop the constitution, fortifying it against disease.

PROPHYLAXIS (PERSONAL).

1. Those infected should be careful to protect others from bacilli-laden particles of nasal and buccal secretions by the judicious use of their handkerchiefs.
2. The family physician should be immediately called, so that treatment may be instituted and proper isolation established.

THE DESIRE OF THE HEALTH DEPARTMENT.

When a physician meets with a series of cases of acute respiratory affections having any resemblance whatsoever to influenza, or whenever suspicions are aroused that he is dealing with an epidemic infectious process, it is the desire of the Health Commissioner that the Health Department be notified, in order to establish as early as possible the causal microorganisms, to the end of anticipating and achieving an early control in what possibly might result in a widespread epidemic. This would also enable the laboratory men and the field workers in the Division of Communicable Diseases to carry out much needed research in respiratory affections. By these means the etiology may be eventually worked out, methods for control of epidemics devised, and, possibly, the basis for specific treatment and prophylaxis, by means of vaccines or sera, may develop.

Dr. Sanborn's communication is as follows:

Similarity in these cases reported by Dr. Ceconi suggests a common bacterial cause. As a carrier of infection, in this instance, neither the milk supply nor any other generally distributed food has been implicated. Fine particles of secretion, either coughed or sneezed, undoubtedly constitute the medium for transmission of the virus.

The highly contagious character of the disease, the clinical course, and the widespread distribution, suggest some bacterial invader other than those commonly held responsible for infections of the respiratory tract in the colder months.

The influenza bacillus comes to mind in this connection as being a possible cause. It is known to be pathogenic, but its specificity as a cause of epidemic influenza has not been completely proven. Nevertheless, it seems fairly well accepted that the influenza bacillus is responsible for epidemic respiratory infections from which it takes its name.

The influenza bacillus is not demonstrable in every case that has typical symptoms of the disease. For instance, Lord reports the finding of the influenza bacillus in the sputum of but three of twenty cases observed by him in 1907. Davis reports the influenza bacillus in only four cases in twenty-four clinically diagnosed as influenza. Courmont[1] states that, given the clinical symptoms pointing toward influenza in the time of epidemic, the fact that no influenza bacilli are found in a given case does not exclude this diagnosis.

Bacteriological examination was made in twelve of the above group of cases, as follows:

In 11, cultures were made from nasal secretion; in 9, cultures from the feces; in 7, cultures from the urine. Smears from the nasal secretion were examined in 12 of these cases.

The results of the examinations were as follows:

In three cases having very acute symptoms and discharge from the nose, smears showed numerous bacilli morphologically, and in staining reaction resembling in every way influenza bacilli. In two of these cases, the cultures upon human blood agar yielded growths also resembling the influenza bacillus. One of these cultures was lost in transplant. The cultures from the third acute case are alive and pure at the present writing.

Smears from the nasal secretion showed fairly numerous minute bacilli, some of them nearly round, the majority of them two or more times as long as broad, and with rounded ends. They occurred singly for the most part, but commonly in pairs, and sometimes in threes. Some of the fields showed a few longer forms. There was no capsulation seen. They decolorized by Gram's method and stained very light red with safranin counter stain.

Growth on Human Blood Agar. The tubes originally inoculated from nasal secretion showed merely scattered colonies of pyogenic organisms after twelve hours. At the end of twenty-four hours' incubation, it was possible, with the aid of a hand lens, to discern very minute transparent colonies,—separate, shiny, and with smooth borders. With the naked eye, these colonies could not be readily distinguished.

Pure cultures obtained give all the characteristics above noted. Freshly prepared human blood agar yielded the best growth. Similar agar several days old gave a slight growth or none at all. Colonies did not become confluent. There was no growth on plain agar. No motility noted.

The conclusion that the bacilli here described belong to the influenza group seems justifiable.

The percentage of positive cases in this group corresponds to that found in the two groups above noted, and clinically diagnosed as influenza. It is, therefore, a reasonable supposition, not susceptible to proof, that in this group of cases we are dealing with one or more types of influenza.

In the original cultures, hemolyzing streptococcus, streptococcus viridans, micrococcus catarrhalis, and pneumococcus,—all possible causes of respiratory infection,—were found. Because of the presence of these possibly pathogenic bacteria, proof that the influenza bacilli found are the causal micro-organisms, is impossible. To this end, in these cases, or in any other similar group, the demonstration of specific antibodies in the blood of the infected patients is required.

[1] Courmont: "Precis de Bacteriologie," 3d edition, p. 768.

AN ANALYSIS OF FOURTEEN CASES OF DIABETES MELLITUS UNSUCCESSFULLY TREATED BY FASTING.

BY ELLIOTT P. JOSLIN, M.D., BOSTON,
WITH
F. GORHAM BRIGHAM, M.D., BOSTON,
AND
ALBERT A. HORNOR, M.D., BOSTON.

(*Concluded from page 378*)

GROUP III. DIABETES OF LONG DURATION.

Changes in the diet and régimé of patients who have suffered from diabetes for many years are always dangerous, and particularly so with the cases of extraordinary length. Treatment of such individuals should never be undertaken lightly nor without a full realization of the gravity involved. This has been illustrated by Cases 295, 304 and 310. (See Joslin, Diabetic Standards, *Amer. Jour. of Med. Sci.*, Vol. 145, p. 474, and also Benedict and Joslin, *Carnegie Publication*, No. 136, pp. 118, 126, 1910.) These three were hereditary cases, and had suffered 9, 7, and 19 years, respectively, coming under supervision finally in a debilitated state. Even at that time the danger of changing the diet was appreciated, and unusual care was taken to prevent a fatal issue. The three cases died in a coma, one upon a sea voyage, one after unusual exertion and one for reasons unknown, in periods of 2½ years, 2 months and 5 months, respectively, after being seen.

Consequently, when Case 887 came for treatment, with a duration of the disease of 29 years, unusual apprehension was felt. For 9 days the patient was not allowed to make the slightest possible change in régimé for, although she was wretched, she was alive. She was then admitted to the hospital, but with much foreboding, although no alarm was felt by other physicians, experienced in diabetes, who saw her. The following chart shows the progress of the patient.

No. 887.

Date.	Vol. c.c.	Diacetic Acid.	NaCl.	Nitrogen G.	Ammonia. Total G.	D:N Ratio.	Sugar in Urine. Total G.	Diet in Grams. Carbohydrate.	Protein.	Fat.	Alcohol.	Calories.	Carbohydrate. Balance G.	$NaHCO_3$. G.	Naked Weight of Patient. Pounds.	Pulse.	Blood Sugar. Percent.	Alveolar Air. CO_2. Percent. 9 A.M.
1915 July 21		++					4%											
26	3000	+++		21.3	3.7		72	37±					— 35+	0				
						[1]Entrance to hospital												
30-31	1350	++++					24	—		0	20	140	—	0	132		0.23	32
31- 1	1250	+					0	0		0	16	112	0	0	131			30
Aug. 1- 2	1650	0					10	5		0	2	34	— 5	0	131			
2- 3	1600	+					13	0		0			— 13	0	128			28
3- 4	1500	+		6.5	2.4	1.85:1	12	0		0	25	175	— 12	4	127		0.18	28
4- 5	2400	+		8.6	2.8	2.79:1	24	0		0	32	224	— 24	24	128			26
5- 6	3000	++		9.0	3.4	2.00:1	18	0		0	32	224	— 18	24	127		0.15	28
6- 7	2800	+++		11.2	3.7	0.98:1	11	0		0	32	224	— 11	36	127		0.19	26
7- 8	2900	++		11.9	4.0	1.43:1	17	0		0	8	56	— 17	36	125			29
8- 9	2950	+++		11.2	3.8	1.52:1	17	0	18	15	24	375	— 17	42			0.28	29
9-10	3900	+++	4.3	17.6	4.3	1.31:1	23	0	26	18	12	350	— 23	30	122		0.21	28
10-11	1750	++++	2.8	6.5	1.7	2.15:1	14						— 14					29
11-12	2900	+++	4.6	11.0	2.7	3.73:1	41									84-144	0.43	14
12-13																136-172		

It will be seen that fasting for 9 days failed to rid the urine of sugar; indeed, upon the 9th day the quantity of dextrose in the urine was 17 grams, and the diet contained but 8 grams of alcohol. It is true that upon the second day after admission the urine was reported as sugar-free, but it is possible, although it cannot be proven, that this was an error. Acting upon this supposition, on this day 5% vegetables (150 grams) were allowed, but except for this day fasting was complete from July 31 to August 7. On August 8 three eggs were allowed; on August 9 three eggs, lean meat (30 grams); on August 10, 200 grams of orange and the whites of 3 eggs, but otherwise the patient took no food, save about 15 grams oatmeal on August 10, from her entrance to the hospital on July 30 to death on August 12.

This case constitutes a distinct failure, and in fact, the only one of those reported so far where there were no mitigating circumstances. And yet inspection of the chart gives good ground for belief that death might now be prevented.

The chart shows that the quantity of urine varied little for the first 5 of the 13 days. From then on it increased in amount, and it is here again significant that with it rose the nitrogen, except upon the second day before death. With the increase in the quantity of urine, there was no increase in acidosis, as shown by the ammonia. The carbon dioxide tension of the alveolar air did not change materially during the whole period, for it was 4.4% upon July 30, and 4% the morning of Aug. 11, but upon the following day, shortly preceding death, it was 2%, but an estimation made at this time may not have been wholly reliable. The inferences which were drawn from the behavior of the alveolar air were misleading. No great change took place in the quantity of sugar excreted. The dextrose-nitrogen ratio at the beginning apparently afforded no index whatsoever of the severity of the disease, though this statement cannot be made without qualification, because the sugar was estimated by rotation instead of by reduction. There are two features, however, which claim attention,—first, the change in weight of the patient from 132 pounds to 122 pounds in 10 days and the low excretion of salt. It would appear that the loss of water which this loss of weight represented might have been accompanied by a washing out of salt, as it is evident it was of nitrogen. This would in part explain the lack of correspondence between the dextrose-nitrogen ratio and the severity of the disease, although at the same time it shows that the mere recording of the dextrose-nitrogen ratio, without a simultaneous record of the weight, can be of little significance.

The salt was not determined except during the last few days of life. It is seen that in this period it was extremely slight, being respectively 4.3 grams, 2.8 grams, and 4.6 grams. These low figures suggest that during the preceding 10 days salt was being lost along with body fluid, and in this loss of weight and body fluid is there not an explanation of the untimely death of the patient? The administration of sodium bicarbonate temporarily halted the progressive loss of body weight. When one compares this case with the preceding, the suggestion is striking that the addition of large quantities of salt to the diet might have led to the retention of body fluid and interreupted the downward course of the patient. A study of the literature shows, as has been pointed out in an earlier article (Experiments on an Ash-Free Diet and Salt Metabolisms, Joslin and Goodall, *Jour. A. M. A.*, 1908, Vol. li, p. 727), that the salt in the urines of diabetic patients dying in coma is unusually low. We should take cognizance of this, and efforts should be made to favor the retention of salt and water by severe diabetics. The retention of body fluid, which often goes hand in hand with the "oatmeal cure," may be one of the chief advantages which have been ascribed to that "cure." The liberal use of broths during the early days of fasting may be helpful in that they contain considerable quantities of salt and prevent loss of body weight. Case 941, who underwent a fasting cure elsewhere, lived upon water alone and lost 5.9 kilograms (13 pounds) in four days.

GROUP IV. INDEPENDENT COMPLICATIONS.

The remaining cases occurred in patients with complications independent of diabetes. In Case 869, there was a high blood pressure, mitral insufficiency and a history of Graves' disease. In another, Case 576, death followed 41 days after the removal of a cancer of the bladder which recurred in the scar of the incision. Vigorous antisyphilitic treatment probably was concerned with the death of Case 806, but no reason save arterioscleoris could be assigned for the death of Case 848. The records follow in detail.

CASE 869. Female, age 46. Came under observation August 2, 1915. Although sugar was reported absent in January, 1915, its presence was discovered May 22, 1915. The symptoms pointed to the onset in May, 1913. Weight June 4, 1915, 134¼ pounds. No acetone odor to the breath, thyroid moderately enlarged, pulse 120, blood pressure 160, with a previous record of 190, as was later learned from another physician. The diffuse and feeble apex beat of the heart was in the sixth space outside the mammillary line, and accompanied by a systolic murmur widely transmitted. The liver was palpable one finger's breadth below the costal margin.

The chart shows that on July 1 there was 4% of sugar in the urine and that this decreased to 2.6% and 1.4% respectively within two days after entrance to the hospital, and on the following day disappeared and remained absent, except for 0.2% during the last 24 hours. On the other hand, with the institution of fasting, acidosis appeared and in-

No. 869

TABLE No. 4.

Date. 1915	Col. c.c.	Sp. Gr.	Reaction.	Albumin.	Acetone.	Diacetic Acid.	B-oxybutyric Acid.	Nitrogen. G.	Ammonia. Total Gms.	Sugar in Urine. Reduction. %	Diet in Grams. Total Gms.	Carbo-hydrate.	Protein.	Nitrogen.	Fat.	Alcohol.	Calories.	Carbohydrate. Balance Gms.	$NaHCO_3$. Gms.	Naked Weight of Patient. Pounds.
June 1.....	Spec.	1025	Ac.			0				4.0		—	—	—	—	0	—	—	0	
2.....	"	1028	"			+				2.6		—	—	—	—	0	—	—	0	
	12°					Entrance to hospital.														
3-4.....	600	1019	"	0		++				1.4	8.4	0	0	0		13.5	95	—8.4	0	134
4-5.....	1500	1017	"	0		+++		11.7		0.0	0	0	0	0		27	189		4.25	133
5-6.....	2100	1011	"	0	6.51	+++	45.31	9.24	1.87	0.0	0	0	0	0		18	126		4.0	—
6-7.....	1900	1011	"	0		+++		6.08	1.28	0.2	3.8	20	2.7				91	+16.2		—
	12°											13	1.8				160			
7.....	900		"	0		+++														

* Total for three days, June 4-7.

creased, but never exceeded that degree represented by 1.64 grams of ammonia in the 24 hours. The ferric chloride reaction, however, increased in intensity and the urinary sediment directly after entrance showed a few hyalin casts and granular casts.

Vomiting began 4 days after admission and persisted until death the same day. The patient did not become unconscious, but undoubtedly succumbed to a relatively mild acid poisoning—incomplete coma. It has been pointed out elsewhere that a moderate degree of acid poisoning may cause the death of a patient previously free from acid poisoning, whereas acid poisoning of a severe character may be borne for years by a diabetic patient in whom it has gradually developed. Furthermore, acid poisoning in a diabetic with impaired kidneys is also serious.

Rapid changes in weight must have taken place in this patient, too, just as in Case 513, described under Infection, and Case 887, described under Diabetes of Long Duration. This is evident, because the patient retained no food for many hours, and yet voided during this period at least 2000 c.c. of urine.

This case and the two just cited have led us to direct our attention to the prevention rather than the treatment of acid poisoning.

CASE 576. Male, age 64. Came under observation January, 1913, reporting the onset and diagnosis of diabetes as having probably taken place in October, 1906. From January, 1913, until the summer of 1914, the patient did fairly well, but at that time a little blood was noticed in the urine. In October, 1914, he was operated upon by Dr. A. L. Chute. Fasting, followed a day later by 160 grams of oatmeal, was the treatment employed in preparing the patient for operation. Following the operation he progressed favorably so far as the diabetes was concerned, but he died 41 days later of a recurrence of the growth in the scar of the abdominal incision.

Syphilis. CASE 806. Male, age 38. Came under observation Dec. 17, 1914, reporting an onset of the diabetes in October, 1914. Venereal infection denied. The eyesight was failing, and the report of the eyes made by a competent oculist on January 5. 1915, was as follows:

"The vision of the right eye is reduced to counting fingers at one foot; that of the left to counting fingers at twelve feet. This reduced vision is due to retrobulbar neuritis. Fundus examination shows slight blurring of disc margins, with some tortuosity of the retinal vessels. There is nothing suggesting a retinitis due to diabetes. The visual fields are characteristic of those of a toxic amblyopia. Questioning him about alcohol and tobacco, it does not seem that he has used either to excess. Yet can find nothing else to account for the condition which the eyes show. It may be that diabetes for some reason predisposes to a more intense action of tobacco on the nerve cells. The question of its being due to multiple sclerosis suggests itself."

Pupils equal and reacted; knee jerks present but diminished. No cervical glands, but the inguinal glands were slightly enlarged, as well as the axillary glands. Thyroid normal, spleen extended 2 fingers' breadth below costal margin, right kidney felt, no edema. Heart normal, pulse 92, blood pressure 150, lungs normal. Acetone odor to breath.

Unfortunately, and as now appears, unaccountable, no Wassermann test was performed at the hospital, but it was later reported positive. It is mortifying that the possibility of syphilis did not occur to me or to the ophthalmologist and neurologist, who saw the patient in consultation.

On Dec. 17, 1914 the per cent. of sugar in the urine was 7.8%, but he became sugar-free after 2 days' fasting. The tolerance gradually rose to 24 grams carbohydrate, 50 grams protein, and enough fat to maintain weight. Following discharge, the patient remained in good condition under the observation of his physician, and, so far as I can learn, was sugar-free. In June, 1915, I heard from his physician that another doctor had obtained a positive Wassermann reaction, that 3 injections of salvarsan had been given, and mercury and iodide of potassium as well. Shortly after, the patient became suddenly ill and died in coma.

CASE 848. The cause of death in this case was unknown, but surely not related to fasting treatment. The patient was 54 years of age. Came under observation March 4, 1915, reporting the onset of diabetes one year before, and its diagnosis 2 months before. Physical examination showed marked arteriosclerosis, blood pressure 125, no enlarged glands, no acetone odor, pupillary and patella reflexes normal, heart and lungs normal. He entered the hospital March 4, 1915, showing 5.6% of sugar, and became sugar-free after fasting 2 days. He was discharged on March 20, weighing 145 pounds, with a positive carbohydrate balance of 45 grams. He returned for a day's observation August 26, 1915. The fasting stomach was empty, and a complete physical examination at this time showed nothing new, though the arteriosclerosis was very apparent. The urine was sugar-free. The weight was 153 pounds, which was the same as on March 5, 1915. He went home, gradually grew weaker, was especially exhausted during 3 very hot days in September, and the physician in attendance reported the discovery of malarial plasmodia. For this he instituted treatment, but the patient died without coma on September 19.

The experience derived from these patients has led us to adopt a preparatory treatment to fasting for very severe, long standing and complicated cases. It is simple and can be stated in the few words which we have incorporated in the following summary of directions for the treatment of diabetes. Except for the change in the paragraph on Fasting, it is essentially the same as that suggested in the *Amer. Jour. Med. Sci.*, for October, 1915, Vol. cl, page 485. For convenience we also insert the diet chart which we usually employ.

SUMMARY OF TREATMENT.

Fasting. Fast until sugar-free. Drink water freely and tea, coffee and clear meat broth as desired. In very severe, long standing and complicated cases, without otherwise changing habits or diet, omit fat, after two days omit protein and halve carbohydrate daily to 10 grams, then fast.

Carbohydrate Tolerance. When the 24-hour urine is sugar-free, add 150 grams of 5 per cent. vegetables and continue to add 5 grams carbohydrates daily up to 20, and then 5 grams every other day, passing successively upward through the 5, 10, and 15 per cent. vegetables, 5 and 10 per cent. fruits, potato and oatmeal to bread, unless sugar appears or the tolerance reaches 3 grams carbohydrate per kilogram body weight.

Protein Tolerance. When the urine has been sugar-free for two days, add 20 grams protein (3 eggs) and thereafter 15 grams protein daily in the form of meat until the patient is receiving 1 gram protein per kilogram body weight, or if the carbohydrate tolerance is zero, only ¾ gram per kilogram body weight.

Fat Tolerance. While testing the protein tolerance, a small quantity of fat is included in the eggs and meat given. Add no more fat until the protein reaches 1 gram per kilogram (unless the protein tolerance is below this figure) but then add 25 grams daily until the patient ceases to lose weight or receives not over 40 calories per kilogram body weight.

Reappearance of Sugar. The return of sugar demands fasting for 24 hours or until sugar-free. The diet is then increased twice as rapidly as before, but the carbohydrate should not exceed half the former tolerance until the urine has been sugar-free for two weeks, and it should not then be increased more than 5 grams per week.

Weekly Fast Days. Whenever the tolerance is less than 20 grams carbohydrate, fasting should be practised one day in seven; when the tolerance is between 20 and 50 grams carbohydrate, upon the weekly fast day 5 per cent. vegetables and one-half the usual quantity of protein and fat are allowed; when the tolerance is between 50 and 100 grams carbohydrate, the 10 and 15 per cent. vegetables are added as well. If the tolerance is more than 100 grams carbohydrate, upon weekly fast days the carbohydrate should be halved.

STRICT DIET.

MEATS, FISH, BROTHS, GELATINE, EGGS, BUTTER, OLIVE OIL, COFFEE, TEA AND CRACKED COCOA.

FOODS ARRANGED APPROXIMATELY ACCORDING TO % OF CARBOHYDRATES.

	5% *	10%	15%	20%
VEGETABLES (fresh or canned)	Lettuce, Cucumbers, Spinach, Asparagus, Rhubarb, Endive, Marrow, Sorrel, Sauerkraut, Beet Greens, Dandelion Greens, Swiss Chard, Celery, Tomatoes, Brussels Sprouts, Water Cress, Sea Kale, Okra, Cauliflower, Egg Plant, Cabbage, Radishes, Leeks, String Beans, Broccali	Pumpkin, Turnip, Kohl-Rabi, Squash, Beets, Carrots, Onions, Mushrooms	Green Peas, Artichokes, Parsnips, Canned Lima Beans	Potatoes, Shell Beans, Baked Beans, Green Corn, Boiled Rice, Boiled Macaroni
FRUITS	Ripe Olives (20% fat), Grape Fruit	Lemons, Oranges, Cranberries, Strawberr's, Blackberr's, Gooseberr's, Peaches, Pineapple, Watermel'n	Apples, Pears, Apricots, Blueberries, Cherries, Currants, Raspberries, Huckleberries	Plums, Bananas, Prunes
NUTS.	Butternuts, Pignolias	Brazil Nuts, Bk. Walnuts, Hickory, Pecans, Filberts	Almonds, Wal'ts (Engl), Beechnuts, Pistachios, Pine Nuts	Peanuts, 40% Chestnuts
Misc.	Unsweetened & Unspiced Pickle, Clams, Oysters, Scallops, Liver, Fish Roe	* Reckon available carbohydrates in vegetables of 5% group as 3%, of 10% group as 6%.		

(30 grams 1 oz.) CONTAIN APPROXIMATELY	PROTEIN. G.	FAT. G.	CARBOHYDRATE. G.	CALORIES.
Oatmeal, dry wgt.	5	2	20	120
Meat (uncooked, lean)	6	3	0	50
" (cooked, lean)	8	5	0	75
Broth	0.7	0	0	3
Potato	1	0	6	25
Bacon	5	15	0	155
Cream, 40%	1	12	1	120
" 20%	1	6	1	60
Milk	1	1	1.5	20
Bread	3	0	18	90
Butter	0	25	0	225
Egg (one)	6	6	0	75
Brazil Nuts	5	20	2	210
Orange or Grape Fruit (one)	0	0	10	40
Vegetables 5 & 10% group	0.5	0	1 or 2	6 or 10
Oysters, six	6	1	4	50

1 gram protein,	4 calories.	1 kilogram = 2.2 pounds.	
1 " carbohydrate,	4 "	30 grams (g) or cubic centimeters (c.c.) = 1 ounce.	
1 " fat,	9 "	A patient "at rest" requires 25 per kilog. body weight.	
1 " alcohol,	7 "		
6.25 g. protein contain 1 g. nitrogen.			

Consult Chemical Composition American Food Materials, Bull. 28 U. S. Dept. Agriculture, by sending 10 cents in coin to Supt. of Documents, Washington, D. C., also Annual Report Conn. Agricultural Experiment Station, New Haven, Conn., Food Produce and Drugs, 1913, Part 1, Section 1.—Free.

A SIMPLE METHOD OF OBTAINING RAGWEED POLLEN IN LARGE QUANTITIES.

BY R. P. WODEHOUSE, CAMBRIDGE, MASS.

[From the Laboratory of Plant Physiology, Harvard University.]

OWING to the number of inquiries received from investigators in the field of hay fever therapy, it seemed desirable to print in an available form the writer's experience in preparing pollen extracts.

While working with Dr. Goodale on hay fever in the summer of 1915, the writer's part of the work (viz. isolation of proteins) necessitated the use of large amounts of ragweed pollen, so the following simple method of obtaining it was adopted:

The flower heads are stripped from young plants, just coming into bloom, and after being allowed to become almost dry, are crushed in a mortar with several volumes of carbontetrachloride. After thoroughly macerating, the liquid is strained off through muslin. Most of the pollen, liberated by crushing from the anthers, passes with the CCl_4 through the muslin and can be collected on filter paper and be washed with fresh CCl_4, or with the same, after filtering out the pollen, to remove what pollen remains after the first washing.

The CCl_4 can be used several times, or until it becomes impregnated with oils, etc., when it should be replaced or distilled to remove the impurities.

This method is very rapid and was found to yield many times more pollen than any other known to the writer. Our experience has also shown that this treatment in no way interferes with the anaphylactic properties of extracts prepared from pollen procured in this way; but in order to get the best results only young plants, taken when the flowers are just opening, should be used, and these collected away from dusty roadsides.

Medical Progress.

RECENT PROGRESS IN PSYCHIATRY.

BY HENRY R. STEDMAN, M.D., BROOKLINE, MASS.

PART II.

PROGNOSIS IN FUNCTIONAL PSYCHOSES.

Kirby[1] states that two views are held regarding the nature of functional psychoses, and the prognostic principles underlying them.

1. Kraepelin uses symptoms of prognostic value as basis for the formation of clinical groups. Reasoning on this basis, he thinks that analysis permits one to identify during the early stages of the disease certain symptoms, or groups of symptoms, which indicate either a good or bad prognosis and differentiate between recoverable and irrecoverable cases. He maintains also that two processes are dealt with, but this view is not always true. At one time Kraepelin diagnosed 52% of his admissions as dementia precox, while in 1909 they formed but 7%, and of 468 cases called dementia precox, 29% were later diagnosed as manic-depressive psychoses.

2. Meyer's view, opposed to Kraepelin's, rests on the psycho-biological interpretation of these disorders, and emphasizes the importance of psychological effects as the dynamic factors. The view of the various forces at work as chains of cause and effect enables one to appreciate that psychoses are biological reactions of a mental type, and the disorder expresses defective adaptation of the individual. On this basis, the resistance of the individual is considered more important than the disease process, and prognosis is determined by the power of mental reaction. In the purest forms of manic-depressive psychosis, the malady is chiefly an emotional deviation and consequently correctible by reason. The prognosis, therefore, is good. In dementia precox the disorder is regarded as a result of long-continued biological maladjustment, the indications of which Meyer believes can often be detected long before the psychosis becomes obvious, a disorder in the realm of thought which causes a "failure of healthy interests and exclusion of normal thinking" and reacts on "the organic substructure of mental life, the brain"; consequently the prognosis is bad.

Kirby contends that there are a few biological reaction types which are useful as guides to prognosis, but there are also many types, not classifiable, in which "a rational prognosis can be determined only by a careful weighing of the dynamic factors in the individual case." To such biogenetic cases the general prognostic principles of Kraepelin are held to be inapplicable.

The validity of Kraepelin's contention that catatonic symptoms in non-organic cases are especially significant of a deterioration process is questioned, and it is shown from Kraepelin's own cases that catatonia has not the value assigned to it. The catatonic syndrome is not a clinical unit, is not confined to dementia precox, but found in organic cases and in infective exhaustive psychoses, and its real meaning and mechanism is unexplained. Its most typical manifestation, "negativistic-stupor," has the general characteristics of a defense reaction. The syndrome seems to be simulated in other disorders as well. Eighty well-defined cases of catatonia are analyzed and grouped as:

1. "Catatonic Psychoses Associated with Deterioration." Cases in which the catatonic reaction was preceded by a gradual change in the personality and in which there were ominous prodromes.

2. "Psychoses Essentially Catatonic Throughout by Ending in Recovery." Mostly cases of catatonic stupor or depression with catatonic behavior, a number of which lasted two years or more, and one five years, and recovered unexpectedly. Analysis of this stuporous case permits the statement that "when the psychosis is expressed exclusively or chiefly in an acute stuporous reaction the prognosis is good." Cases beginning with "odd behavior, grimacing and stereotypes, followed by gradual establishment of a stuporous condition with negativism and fixed postures" have a bad prognosis.

3. "Psychoses Presenting, Besides Catatonic Symptoms, Manic-Depressive Features." The over-valuation of the catatonic manifestation was the cause of error in many cases. A clear manic-depressive symptom picture and a typical catatonic syndrome were found at different times in the same individual, and in many cases catatonic phases replaced the depression in circular attacks.

The author concludes that: Very similar clinical pictures occur in deteriorating and non-deteriorating forms. The study of the constitutional tendencies and the mode of development of the psychosis gives more reliable prognostic data than the clinical picture. A history of gradual changes in personality, with indications of defective biological adaptation points to a bad prognosis. Acute stupors developing without characteristic prodromes have a good outlook. The psychological interpretation puts before us the possibility of modifying the dynamic factors in certain cases.

HEREDITY IN PSYCHOSES.

Jolly[2] offers a detailed and painstaking study of heredity in connection with the study of twenty-one families in which various psychoses occurred. He draws the general important conclusion that the former view, that there is a strong tendency for families so afflicted to die out in relatively few generations, is now untenable. His study shows that no degeneration or advancing depreciation of the family stock could be demonstrated. The degeneration of the race from a psychopathic standpoint, if such occurs, is not due to the appearance of endogenous psychoses, but rather to an injury of the germ-plasm, above all by alcohol and syphilis. A detailed statement of the types of psychoses occurring in the various families leads to interesting conclusions regarding heredity. The difficult subject can fitly be determined with fair scientific accuracy only by the collection and intensive study of a great number of families.

GASTRIC PSYCHONEUROSES.

Calligaris[3] thinks that clinicians are too apt to regard the majority of stomach affections too exclusively as symptomatic, while neurologists regard them exclusively as purely functional and of psychic origin. The treatment of these two extremes is exactly opposite, and woe betide the nervous dyspeptic who falls into the hands of a clinician who disregards the nervous element or, *vice versa*, the patient with organic trouble, whose precious time is wasted on psychotherapy alone. Calligaris classifies gastric neuroses in two types: the false, symptomatic or secondary, and the true, the essential or primary neurosis of the stomach. The history of this latter type is scarcely fifty years old. The symptomatology is rich indeed. The kaleidoscopic picture is the chief point in differentiation. Generally there are both sensory and motor symptoms. Vomiting may occur in this type, but the possibility of hematemesis of purely nervous origin is generally denied. Calligaris is convinced that this denial should not be too absolute, but he does not believe in the possibility of an exclusively gastric neurasthenia.

The examination of the stomach should be done with extreme caution and tact to refrain from suggestion that may add new features to the clinical picture. Organic trouble should be suggested more readily if the patient is near or past fifty. A purely functional stomach trouble may lead to an organic affection, thus setting up a grave vicious circle. There is no doubt that certain patients with true gastric neuroses have recovered under courses of dieting and medicines, but there is also no question of doubt that hosts of others have had their gastric neurosis bred into a chronic and possibly an incurable phase by such measures.

He has had an opportunity to study fifty individuals with true gastric neuroses. It was easy to trace the relation between cause and effect, between emotions, phobias, auto-suggestion and suggestion from others, and the development of the neurosis to follow day by day and hour by hour the course of the symptoms from the stomach as they paralleled the fluctuations in the moods and emotions, and to note the regular, transient aggravation of the neurosis after certain happenings, and the rapid and progressive improvement under psychotherapy. Disturbances in secretion, motor functioning and sensation, in patients growing more and more debilitated, disappeared surprisingly fast under appropriate psychotherapy, and the downward trend toward mental anorexia was thus arrested. Some of these patients had long complained of loss of appetite and inability to eat, and had lost from twenty to thirty-three pounds, but under eight or ten weeks of isolation and psychotherapy, they regained strength and almost their former weight. The outcome confirmed the correctness of the diagnosis and treatment; if treatment had been on the basis of an assumed organic trouble, the old disturbances would have been kept alight or fanned into a flame. It is in these cases that "local treatment kills; general treatment saves." Both Dubois and Dejerine believe that fully four-fifths of dyspeptic disturbances are of purely nervous origin.

Even reducing this figure by one-half, leaves a large number of which this is certainly true. They owe their origin to some emotional stress or to suggestion from within or without, and mostly to suggestion from some medical treatment which fixes the gastric neurosis still more firmly in the patient's mind, by the questions asked, repeated examination, restrictions in diet, and polypharmacy. "There are stomachs for the chemists and the radiologists, and also for the psychologists, the psychiatrists and the neurologists." He adds, "Nature presents her phenomena with a thousand aspects, but man is liable to see only the one aspect which his eyes have been trained to see."

(To be continued.)

Society Report.

WORCESTER DISTRICT MEDICAL SOCIETY.

A regular meeting of the Worcester District Medical Society was held in Grand Army Hall, Worcester, on Wednesday afternoon, December 8, 1915. The following papers were read:

1. Report of Committee on Control of Venereal Disease, Dr. Frederick H. Baker, Worcester.

2. Some Present-Day Problems in Surgery,* Dr. Michael F. Fallon, Worcester.

Harvard Medical School.

HARVARD MEDICAL SOCIETY.

HISTORICAL CLUB MEETING IN THE PETER BENT BRIGHAM HOSPITAL AMPHITHEATRE, TUESDAY EVENING, MARCH 7TH, AT 8.15 O'CLOCK.

DR. EDWARD C. STREETER, president, in the chair.

Paper of Prof. Joseph M. Flint, New Haven: Experiences in a Base Hospital in France.

THE Hôpital Français, New York, Fondation-Fitzgerald, was opened during the early part of last March. It was organized by Mr. Dwight who completed his arrangements through the French Ambassador in New York. It is situated about sixty miles southeast of Paris in a small village of some three hundred inhabitants. This is within the fifth French military region.

The hospital has about one hundred and sixty-three beds. The buildings include an old château, the earliest portion of which dates back to the 15th century. A moat surrounding the château was constructed at the same period. The other buildings were erected in the early part of the 17th century.

The supplies for the present work come entirely from America. The equipment now is excellent and compares favorably with that of any American hospital. The personnel consists of four American surgeons, 12 registered nurses, a group of French volunteers corresponding to our probationers and an office force, in all between 50 and 67.

The problems which the unit headed by Dr. Flint had to face were those met with in any base hospital. Due probably to the fact that the hospitals were wholly inadequate at the outset of hostilities, the average American continues to believe the French Medical Service is still inefficient. This, however, is not the case. An authority on military medicine has recently stated that the French service is now superior to the German. This may be explained by the fact that the Germans have been the invaders.

One remarkable feature of the present conflict in France, is the relative fixation of the western battle line. This whole district is thickly populated and it is well supplied with railroads, good buildings and excellent roads. These conditions naturally permit a rapid transference of the wounded, and they furnish the necessary means for improvising satisfactory hospitals. Hence a new type of military surgery has come into being.

One of the most difficult tasks facing the organizing staff was to learn the duties of the sixty odd individuals who comprised the hospital's personnel The problem was finally greatly simplified by constructing an organization chart in two colors, red for the military and black for the civil staff.

Food is now furnished at a cost of 1 franc 85 to 1 franc 90 per patient a day. When the hospital is fairly well filled, each patient can be housed and treated for about 5 francs 50 to 6 francs 25, like a well-run American hospital.

A man wounded in the first line of trenches usually receives the so-called first aid treatment, as soon as possible. He is then carried back through the communicating trenches to a shell-proof shelter of some sort where antitoxin may be administered, temporary splints applied or severe hemorrhage arrested. From here, as a rule, he is carried to where the reserves of the second line are stationed. An ambulance may now reach him. The ambulance then transports him to an evacuating centre, a hospital centre consisting of a medical and a surgical unit. The evacuating trains are made up at such a centre, and bear the wounded to a base hospital in the interior.

There are a number of so-called distributing officers whose duty it is to keep themselves informed of the available hospitals and hospital beds. When a train is made up, such an official designates what base is to receive the wounded, and he telegraphs ahead informing each institution what cases they may expect. Ambulances at the base hospitals are dispatched to meet the incoming trains.

* See JOURNAL, page 407.

The hospital trains are of three types. The permanent trains of this nature are relatively few in number. The semi-permanent hospital trains consist of the ordinary civil day coaches which are constructed with sockets for stretcher racks, having in mind the possibility of such a future use. The old sleeping coaches corresponding to our own Pullmans are practically all used for the living quarters of the sanitary staff. The third type of train, the so-called temporary sanitary train, is made up of freight cars equipped with stretchers.

One of the interesting features of the transportation of the wounded is the attitude of the French toward the German prisoners. The innate courtesy of the French is so great, that the wounded Germans receive but little more notice than if they were arriving in a German instead of a French town. Another striking feature is the spirit and comradeship of the convalescents. Often these are little short of being remarkable. Those who can be up and about are always willing to perform any duty.

Very remarkable work is being done in the American Ambulance in Paris in the surgery of the nose and face. The great majority of the patients received at the Hôpital Français, New York, have wounds of the extremities or head. Only the chest cases without serious dyspnoea and those with non-penetrating wounds of the abdomen are sent back to the base hospitals. It is the bullet wounds with small sites of entrance, but large gaping exits, that led to the accusation of the use of soft-nosed bullets during the early months of the war. Patients with such injuries are wounded during the early trajectory of the bullets.

In the Hôpital Français, a special technique was developed for the localization of foreign bodies. The Profundameter method was found to be the best. After localizing the bullets or shell fragments in this manner, about 80% of the operations became minor operations, and were usually carried out under local anesthesia.

While secondary hemorrhage is very rare in civil work, it is relatively very frequent in this type of practice. This is due, in part, to the fact that the action of a high velocity ball extends for a comparatively long distance, beyond the tunnelled part of the wound.

The Germans have been using for some time shells containing a gas which is very irritating to the eyes. These have been called the tear-shells. While the gas leads to a marked conjunctivitis which lasts over several weeks, the vision, as a rule, remains unimpaired.

A mild type of erysipelas lasting two or three days is of very frequent occurrence in the French hospitals.

Carrel's fluid for disinfecting wounds was found to be very irritating. Gentian violet, suggested first by Dr. Churchman, proved to be most serviceable. In high dilutions it is germicidal for all gram-positive organisms, and it is not poisonous to the cells. In a strength of 1-5000 it is one of the best of all modern antiseptics. Its drawbacks are merely aesthetic in nature—discoloration.

The hospital contains beds bought 150 to 200 years ago, which were provided with supports for curtains to keep off drafts. These supports were found to be ideal for fracture beds.

There are now about 500,000 beds organized by the French for military purposes. When one remembers that France can pay only about fifty cents a day per patient, one realizes that the type of service now given is little short of being remarkable.

(Lantern slides were shown to illustrate the paper).

Dr. W. T. Councilman: Some Letters from the Countries at War.

ERNEST G. GREY, M.D.

Book Reviews.

An Autobiography. By EDWARD LIVINGSTON TRUDEAU. Philadelphia: Lea, Febiger & Company. 1916.

The reviewer has had the rare privilege of knowing and talking with Dr. Trudeau many times during the past few years, and of receiving his wise counsel and advice in regard to the various perplexing problems concerning tuberculosis. Last spring, Dr. Trudeau read to him various portions from his then unpublished autobiography. It is, therefore, very much a labor of love to review this book.

There are too many autobiographies which consist merely of a catalogue of events, usually the more important and striking events in the life of the person concerned. A real autobiography should consist of more than this. Not only the great events, but various details, should enter in to make the volume not only a history of what this or that person has done, but a history of the thoughts, feelings, joys, and sorrows, as well as the achievements of the writer. This is what Dr. Trudeau has accomplished in a most remarkable degree. To the reviewer, who is most deeply interested in the subject to which Dr. Trudeau gave his life, the book is of absorbing interest. To everyone else, however, physician or layman, whether or not interested in the great problem of tuberculosis and its conquest, the description of what this man, terribly handicapped as he was, has done in the world and for the world will prove a source of comfort and inspiration.

The literary style is simple, straightforward, and yet so vivid that one suffers and rejoices with him in his journey through life. In the reviewer's opinion, this autobiography is a literary achievement of no small value.

This simple narrative should prove a tremendous help to all of us: to those of us who are in any way handicapped by sickness or circumstances, it will be a source of courage and a stimulus to renewed efforts; to those of us who are so fortunate as to be healthy and strong, it will be a constant reminder of what we ought to be able and, at least, ought to aim to accomplish, when we think of what Dr. Trudeau, "the beloved physician," has done in life.

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ERNEST GREGORY, *Manager.*
126 Massachusetts Ave., Corner Boylston St., Boston, Massachusetts.

FIRST YEAR OF THE HARRISON NARCOTIC ACT.

THE provisions of the federal act regulating the dispensing and distribution of narcotic drugs, which went into effect March 1, 1915, were summarized in an insert in the JOURNAL of Feb. 18, 1915, and editorial comment followed in the issue of March 4, 1915. The profession has become accustomed to the slight annoyance caused by the necessary registration, with its attendant small fee, and has coöperated heartily in checking a great evil—the abuse of narcotics. From those who have been entrusted with the enforcement of the act we learn that druggists are very generally obeying the law, that the peddling of morphine and cocaine by vendors who had purchased the drugs on prescriptions from irregular practitioners of medicine has been very nearly abolished in this neighborhood, but that there are still unprincipled physicians who are making money in the following fashion: A morphine eater consults a physician whose name has been given him by another addict and says, "Doctor, I am a morphine user. Will you prescribe for me?" "How much morphine are you accustomed to use?" "About ten grains a day." The doctor makes out a prescription for a dram of morphine and counsels the patient to use only so much as he directs. Whereupon the drug user departs to have his prescription filled and another unfortunate mortal with a craving takes his place. Naturally this is not the *lawful practice of medicine* within the meaning of the language of the act. To gather proof that the law is being evaded by this particular method of prescribing is by no means easy of accomplishment, and the federal authorities need, and should have, any assistance the right minded members of the profession can give in bringing to justice those who are thus stultifying themselves and their calling.

THE ARMY REORGANIZATION BILLS. PREPAREDNESS.

IN a recent hearing before the naval affairs committee of the House of Representatives, one of the Congressmen asked Capt. Thomas Washington, hydrographer of the Navy, a witness, what, in his opinion, was the most necessary thing for a nation to be prepared with, going to war. The captain answered, "A wise Congress." We are about to have a test of the wisdom of the men the people have sent to Washington to represent them, in their action on the Army and Navy reorganization bills, and we hope that the efforts of the late Dr. W. L. Rodman and other prominent medical men to have a sufficiently large medical department incorporated in these bills will bear fruit.

According to the terms of the House bill, the regular army of the United States is to be increased to a total enlisted force of 140,000 men, with a reserve of 60,000. The medical corps is increased by 8 colonels, 14 lieutenant-colonels, 60 majors, and 169 captains and first lieutenants, there being a clause as to the dental corps providing for 35 captains. It is provided that the enlisted force of the corps shall be equal to an equivalent of 5% of the total enlisted strength of the Army.

The Senate has before it an Army bill calling for a peace strength of 178,000 men and a war strength of 250,000. Section 11, having to do

with the medical department, provides for one major-general, 20 colonels, 40 lieutenant colonels, 214 majors, 622 captains or first lieutenants. The present medical reserve corps and nurse corps are continued as now provided by law. Provision is made for dental surgeons, one for each 1,000 enlisted men of the line.

It is reassuring to learn from the *Military Surgeon* that the reserve corps of the Army medical department has taken time by the forelock and now aggregates nearly 1,600 commissioned officers of recognized standing and proved ability. These officers are being organized into groups in the larger cities for purposes of instruction; more than 500 of them are taking the correspondence course from the Medical Officers' School at Fort Leavenworth, so that this branch of the service at least has already exercised effective foresight and preparedness.

The medical men of the country take an active interest in preparedness, realizing that this is one of the few benefits conferred on the United States by the present conflict in Europe, forcing home the importance of fostering patriotism and self-sacrifice for an ideal; in bringing a larger number of men into intimate relations with the high charactered personnel of the Army and Navy, thus restoring the service to its proper place of esteem in the minds of the people, and in repudiating the taunt of Europeans that we had become a nation of money-getters and money-worshippers. "An intellectual and vigorous nation can experience no worse destiny than to be lulled into a Phaeacian existence by the undisputed enjoyment of peace."

STATUS OF ARMY DENTISTS.

A section in the proposed army reorganization bill at present pending before the National Congress, provides for raising the standard of the dental service in the United States army by making surgeon dentists eligible for promotion to the grade of captain and major. Under existing regulations, the limited opportunity for advancement in rank makes it difficult to attract and retain first-class men in this service. The Massachusetts Dental Society, and the National Dental Organization, which has a membership of 20,000, both earnestly advocate this measure. The experience of the European War has shown conclusively the importance of dental surgery in armies, not only for the adequate treatment of wounds involving the jaws, but in the maintenance of health and efficiency among troops in times both of war and of peace.

RACE TYPES IN MAN.

In the issue of the Journal for March 4, 1915 (Vol. clxxii, p. 321), we published the first of a projected series of articles by Dr. John Bryant of Boston, presenting his researches on the carnivorous and herbivorous types in man; and in the same issue commented editorially on certain aspects of the significance of his work. In the issue of the Journal for June 17, 1915 (Vol. clxxii, p. 881), Dr. Joel E. Goldthwait of Boston, in his Shattuck Lecture delivered that year before the Massachusetts Medical Society, discussed further certain of these aspects, particularly the application of the theory of human types to the anatomic and mechanistic conception of disease; and in the same issue appeared further editorial discussion of the question.

In the issue of the Journal for September 9, 1915 (Vol. clxxiii, p. 384), we published the second in the series of Dr. Bryant's articles dealing with other general considerations concerning the carnivorous and herbivorous types in man and the possibility and utility of their recognition. In the same issue of the Journal we again commented editorially on certain possible relations between physical types and professional efficiency.

The views advanced in these articles and editorials, however, have not passed unchallenged. In the issue of the Journal for Jan. 27, 1916 (Vol. clxxiv, p. 127), we published an article from the standpoint of an anthropologist by Dr. E. A. Hooton, of Cambridge, in criticism of the theories developed by Dr. Bryant and Dr. Goldthwait. In the succeeding issue of the Journal for February 3, 1915, (Vol. clxxiv, p. 160) we published a reply by Dr. Goldthwait to some of Dr. Hooton's comments.

In another column of the present issue of the Journal we publish a further and more extended reply by Dr. Bryant, in which he dis-

cusses at length various points raised by Dr. Hooton with reference to the theory of human types and the importance of their recognition.

It is not our purpose editorially to attempt to judge the arguments brought forward on both sides of this purely academic and scientific discussion, upon whose merits readers should form their personal opinions after careful consideration of the problems involved. It is, perhaps, of interest, however, at this time, when the anthropological aspect of the subject has been brought into especial prominence, to call attention to an editorial comment that has recently appeared in the *Lancet* (Jan. 20, 1916) on the subject of race types in man, particularly with reference to the mixed and complicated ethnological conditions of the races of Europe.

"Since the almost entire disappearance from ethnology of the Aryans and the merging of the Celts in the Alpine stock of Central Europe, the old race divisions have practically vanished. It would, indeed, seem, in view of the now accepted doctrines as to the distribution of the long-headed and short-headed races throughout Europe, that the French are half Germans, the Germans half Celts, the Anglo-Saxons mainly Scandinavians, the Celtic Fringe not Celtic at all but Iberian. Even the Basques would seem to have ceased to be a homogeneous racial relic, and to be Iberians or Alpines according as they live south or north of the Pyrenees. Not a little of the Germanization of the older ethnologists may be said to have been due to the teachings of Max Müller, whose assiduously preached Aryans, emanating from a vague plateau in Central Asia, were virtually Germans. He was followed by Bergmann, among others, with his Scythian ancestry of the Slavonic and Teutonic races, and among ourselves by such brilliant historians as Stubbs and Freeman, who traced the institutions of our Anglo-Saxon ancestors to the German forests and to their denizens as described in the "Germania" of Tacitus. Historians such as Coote, with his theory of Roman influences, and anthropologists have for many years been fighting counter to these doctrines. By the aid of craniometry it is now pretty well established that Europe is at most divided between two or three strata of races—the dolichocephalic, the mesocephalic, and the brachycephalic. The dolichocephalic are the oldest, and are pre-Aryan. On the high authority of Ripley, Keith, Chalmers, Mitchell, and others we now know that the dolichocephals or long-heads, coming originally from the northern shores of Africa, have encircled Europe to the northwest as far as Finland. The short-heads are at most only a zone or offshoot in Central Europe of some race derived from Asia, and are, perhaps, the Aryans or Aryan Celts. They brought with them from beyond the Black Sea the Sanskritic language-drift, cremation, and the use of metals."

It may be taken for granted, we assume, that the dolichocephalic, the mesocephalic and brachycephalic types, to which this writer refers, roughly correspond to the carnivorous, normal and herbivorous types of Dr. Goldthwait and Dr. Bryant. "It does not by any means follow, however, that the brachycephalic is in any way inferior to the dolichocephalic in intellectual achievement or in capacity for civilization." Indeed the types exist side by side in nearly all the European races and are, perhaps, to be regarded as representing individual rather than racial evolutionary phenomena. In any event, this comment upon race types in man in the European countries is contributed for whatever value or bearing it may have upon the discussion relative to the anthropology of carnivorous and herbivorous types.

MEDICAL NOTES.

MEDICAL EDUCATION IN CHINA.—Earlier in the winter the JOURNAL reported the departure for China of a committee consisting of Drs. Flexner, Welch and Buttrick, to investigate medical education in that country and plan for its extension. This committee has recently returned to the United States and announces its purpose to establish two new hospitals in China to serve as units for the education of students in medicine and in nursing. This work is under the auspices of the Rockefeller Foundation.

TYPHOID FEVER IN THE UNITED STATES NAVY.—The recently published annual report of the surgeon-general of the United States Navy shows that during the fiscal year 1915 there were in the navy only thirteen cases of typhoid fever, with no deaths. In 1912 there were 222 cases with fifteen deaths. This improvement is attributable almost wholly to prophylactic inoculation.

PROPAGATION OF THE FEEBLE-MINDED.—After four years' investigation among the population of England and Ireland, the Royal Commission compiled statistics in 1912 which made it evident that the feeble-minded mothers of Great Britain have proportionately twice as many children as the normal. It should be noted, of course, that the birth rate among the very poor and feeble-minded is not an accurate index of permanent increase, since the low mental and financial status of the parents lessens the children's chances of survival. The infant death

rate in the illegitimate Kallikak line, for instance, was about six times as great as in the legitimate line.

NEW YORK DEATH RATE GOING DOWN.—According to an analysis of the vital statistics made by Dr. W. H. Guilfoy, Registrar of the Department of Health, 1603 persons died in the city of New York last week as compared with 1548 during the corresponding week of last year, and with 1628 during the previous week of this year. The death rate for the past week was 14.97 and 15.20 for the previous week, while it was 14.81 for the week ending March 6, 1915. Although 55 more deaths were recorded during the past week than during the corresponding week of last year, the increase in the population of the city accounted for all but 17. The total deaths from contagious diseases was 56, the same as during the previous week. The deaths from heart disease and Bright's disease, as well as the deaths from influenza, bronchitis and pneumonia, were less numerous during the past week than during the previous week. They were, however, slightly more numerous than during the corresponding week of last year. The death rate for the first ten weeks of 1916 is 15.94 per 1,000 population as compared with 14.78 for the corresponding period of 1915.

UNIVERSITY OF ILLINOIS.—It is announced that the University of Illinois has recently purchased for its School of Pharmacy, a new site and buildings, formerly erected for the Chicago Homeopathic Medical College and Hospital.

HARDINGE MEDICAL COLLEGE.—The Lady Hardinge Medical College and Hospital at Delhi, India, was formally opened by Lord Hardinge on February 17. The staff and plans of the hospital are announced as follows:

"Principal and professor of medicine, Dr. K. A. Platt; professor of anatomy and gynecology, Miss Hitton; professor of pathology, Miss Field; professor of anatomy, Miss Murphy; professor of chemistry, Miss A. M. Bane; professor of biology and physiology, Miss M. R. Holmer. It is expected that tuition will begin next September, and the government of India will contribute a lakh of rupees (about $33,500) yearly to the annual maintenance charges."

LARGE HOSPITAL BEQUESTS.—The will of the late Robert R. Rhodes which was probated at Cleveland, Ohio, on March 8, contains a number of large bequests to hospitals and other medical institutions. Through the Medical School of Western Reserve University, a total of about $500,000 will be devoted to medical charity and education. The Lakeside Hospital receives a bequest of $250,000, the Charity Hospital, $50,000, the St. Alexis Hospital, $50,000, the Western Reserve Medical School, $50,000, the Baby's Dispensary and Hospital, $25,000, the Tuberculosis Free Dispensary, $25,000 and the Maternity Hospital, $25,000.

CROWN GALL OF PLANTS AND CANCER.—In previous issues the JOURNAL has commented from time to time on the work of Mr. Erwin E. Smith of Washington on the etiology of plant cancer and its analogy to cancer in man and in other animals. In a recent communication to *Science* (March 10, 1916) Mr. Smith reports from his continued experiments that he can now produce embryonic teratomata at will in plants by bacterial inoculations.

"All that is necessary is to inoculate growing plants in areas containing dormant totipotent or pluripotent cells, using *Bacterium tumefaciens*. Moreover, as in man, daughter tumors are produced freely and these also contain teratoid elements. These results have been obtained repeatedly during the last two months on *Pelargonium*, tomato, tobacco and citrus."

A full account of these experiments and results is to follow this preliminary announcement and will be awaited with especial interest by students in cancer research.

JEAN DE RUFZ DE LAVISON PRIZE.—Paul Becquerel of the Faculty of Sciences, Paris, has been awarded the Jean de Rufz de Lavison Prize. This is bestowed by the Academy of Sciences for work in physiology. Dr. Becquerel had done research work in the investigation of latent life in germs. "He studied first the duration of life in seeds known to have passed long periods of natural desiccation, including those from ancient tombs, hiding places and in different collections. He has eliminated as suspicious much material on which earlier essays have been founded, and these eliminations include the mummy corn and similar items. He has taken up the collections of the museums, where the age of the seeds may be precisely determined from the records, and fixes the limit of life in such seeds or spores at about eighty-seven years. The experiments have been conducted with a great variety of material and in many ways. Spores of Ascomycetes and other fungi were kept in the temperature of liquid air for a number of weeks and in that of liquid hydrogen for a number of days, but they germinated with apparently the same facility as the untreated spores. Experiments like this lead the investigator to incline to the hypothesis of latent life where the chemical activities are absolutely suspended. It is still desirable to wait, however, till more prolonged experiments can be made on the stability of protoplasma under conditions that are trying or in low temperatures."

REPORT OF JORDAN MEMORIAL SANATORIUM.—The Jordan Memorial Sanatorium for tuberculosis patients, situated in River Glade, New

Brunswick, states in its third annual report that it has treated 94 patients during the year, and has discharged 65. Of this number, 11 were unimproved, 25 were improved, 14 quiescent, 14 apparently arrested and 1 arrested.

EUROPEAN WAR NOTES.

ANTI-TYPHOID VACCINATION IN EUROPEAN ARMIES.—Some interesting figures on the results of anti-typhoid vaccination in the armies of the British and French have been published. They state that in the fifteen months preceding November, 1915, there were 1365 cases of typhoid among the British troops in France and Belgium. In groups of practically equal size in which the determinations were unquestionable, the mortality among those who had been inoculated was six per cent., and among those not inoculated more than twenty per cent. Similar figures are quoted for the French, whose total in typhoid was 1347. Here three-quarters had not been inoculated, and among these men the mortality was seventeen per cent. of the incidence, while among the inoculated it was three per cent. Further figures analyze the groups with reference to inoculations and the mortality of those who received one, two, three and four injections were respectively six, four, two and one-half and two per cent.

WAR RELIEF FUNDS.—On March 18 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund	$106,936.11
Serbian Fund	83,592.60
French Wounded Fund	60,870.54
Armenian Fund	35,365.18
French Orphanage Fund	32,665.22
Polish Fund	24,899.03
Surgical Dressings Fund	20,772.17
La Fayette Fund	19,568.53
Italian Fund	16,455.00
P. S. D. Fund	4,762.50

BOSTON AND NEW ENGLAND.

THE WEEK'S DEATH RATE IN BOSTON.—During the week ending March 18, 1916, there were 267 deaths reported, with a rate of 18.31 per 1,000 population as compared with 269 and a rate of 18.74 for the corresponding week of last year. There were 51 deaths under 1 year as compared with 34 last year, and 78 deaths over 60 years of age against 95 last year.

During the week the number of cases of principal reportable disease were: Diphtheria, 47; scarlet fever, 44; measles, 115; whooping cough, 37; tuberculosis, 42. Included in the above were the following cases of non-residents: Diphtheria, 2; scarlet fever, 9; measles, 1.

Total deaths from these diseases were: Diphtheria, 7; measles, 3; scarlet fever, 1; whooping cough, 3; tuberculosis, 21. Included in the above were the following deaths of non-residents: Diphtheria, 3.

MEASLES IN BROCKTON.—Report from Brockton, Mass., on March 11 states that measles is at present epidemic in that city. Nearly 100 new cases with five deaths have been reported since March 1.

"The latest serious epidemic of measles in this city was in 1909, when more than 700 cases were reported during the month of March. In 1904 there were nearly 1500 cases in March and February. The five deaths during the past week, however, have given this year's epidemic a more serious aspect. It is not confined to any one section of the city, and it may be necessary to close the schools, although that action has not yet been contemplated."

THE CONCLUSION OF BABY WEEK.—It is reported that the Committee of Arrangements of "Baby Week" consider the venture a success, at least so far as attendance at most of its lectures was concerned. Addresses given at the various meeting places met with earnest attention and ready response. The widespread interest which popular movements of this kind create has hopeful significance for all who are active in public health work.

HOSPITAL BEQUESTS.—It is announced that the Choate Memorial Hospital of Woburn has received a gift of $20,000, through the will of the late Mrs. M. Louise Beggs of Woburn. The money is to be used for the construction of an addition to the hospital, to be known as the William Beggs Memorial.

Through the will of the late Maria M. Browne of Boston, the Massachusetts Homeopathic Hospital has been made the recipient of a gift of $5000.

Obituary.

BENJAMIN FRANKLIN CAMPBELL, M.D.

DR. BENJAMIN FRANKLIN CAMPBELL died at his home in Brookline, Mass., on March 9th, aged 81 years. He was born near Halifax, Nova Scotia, on Sept. 12, 1834, and was a graduate of the Harvard Medical School in the class of 1857. In 1858 he joined the Massachusetts Medical Society and was a Councillor from the Suffolk District Medical Society from 1890 to 1902, having his home and practising his profession in East Boston. During the Civil War he was Acting Assistant Surgeon, U. S. A., from May, 1862, to June, 1862, and from November, 1864, to January, 1865, when he was discharged. He was attached to the Army Field Hospital on the Pamunkey River, Virginia, and later was

assigned to the Webster United States Hospital at Manchester, N. H. Dr. Campbell served several years on the school board and had represented East Boston in both the House of Representatives and in the Senate.

He is survived by his widow, who was Miss Albina M. C. Anderson, and by a son and two daughters.

Miscellany.

CAUSES OF DEATH IN THE UNITED STATES.

THE census bureau of the United States Department of Commerce has recently issued a summary of its statistics of causes of death in the registration area in 1914. This area represents about two-thirds of the population of the country. Of the 898,059 deaths which occurred in that area in 1914, over 30% were due to tuberculosis, pneumonia and diseases of the heart and over 60% were due to these three together with cancer, diseases of the kidney and blood vessels, enteritis, diphtheria, diabetes and typhoid fever.

"The deaths from heart diseases (organic diseases of the heart and endocarditis) in the registration area in 1914, numbered 99,534, or 150.8 per 100,000 population. The death or mortality rate from this cause shows a marked increase as compared with 1900, when it was only 123.1 per 100,000.

"Tuberculosis in its various forms claimed 96,903 victims in 1914, of which number 84,366 died from tuberculosis of the lungs (including acute miliary tuberculosis). As a result of a more general understanding of the laws of health, the importance of fresh air, etc., due in part, no doubt, to the efforts of the various societies for the prevention of tuberculosis, there has been a most marked and gratifying decrease during recent years in the mortality from this scourge of civilization. In only a decade—from 1904 to 1914—the death rate from tuberculosis in all its forms fell from 200.7 to 146.8 per 100,000, the decline being continuous from year to year. This is a drop of more than 25%. Prior to 1904, the rate had fluctuated, starting at 201.9 in 1900. Even yet, however, tuberculosis has the gruesome distinction of causing more deaths annually than any other form of bodily illness except heart diseases, and over 40% more than all external causes—accidents, homicides, and suicides combined.

"Pneumonia (including bronchopneumonia) was responsible for 83,804 deaths in the registration area in 1914, or 127 per 100,000—the lowest rate on record. The mortality rate from this disease, like that from tuberculosis, has shown a marked decline since 1900, when it was 180.5 per 100,000. Its fluctuations from year to year, however, have been pronounced, whereas the decline in the rate for tuberculosis has been nearly continuous.

"The only remaining death rate higher than 100 per 100,000 in 1914, was that for Bright's disease and acute nephritis, 102.4. The total number of deaths due to these maladies in 1914, was 67,545, more than nine-tenths of which were caused by Bright's disease and the remainder by acute nephritis. The mortality from these two causes increased from 89 per 100,000 in 1900, to 103.4 in 1905, since which year it has fluctuated somewhat.

"Next in order of deadliness come cancer and other malignant tumors, which filled 52,420 gaves in 1914. Of these deaths, 19,889, or almost 38%, resulted from cancers of the stomach and liver. The death rate from cancer has risen from 63 per 100,000 in 1900 to 79.4 in 1914. The increase has been almost continuous, there having been but two years—1906 and 1911—which showed a decline as compared with the years immediately preceding. It is possible that at least a part of this indicated increase is due to more accurate diagnoses and greater care on the part of physicians in making reports to registration officials.

"Diarrhea and enteritis caused 52,407 deaths in 1914, or 79.4 per 100,000. This rate shows a marked falling off as compared with the rate for the preceding year, 90.2, and a very pronounced decline as compared with that for 1900, which was 133.2. Nearly five-sixths of the total number of deaths charged to these causes in 1914, were of infants under two years of age.

"Apoplexy was the cause of 51,272 deaths, or 77.7 per 100,000. The rate from this malady has increased gradually, with occasional slight declines, since 1900 when it stood at 67.5.

"Arterial diseases of various kinds—atheroma, aneurysm, etc.—caused 15,044 deaths, or 22.8 per 100,000, in the registration area.

"No epidemic disease produced a death rate as high as 18 per 100,000 in 1914. The fatal cases of diphtheria and croup—which are classed together in the statistics, but practically all of which were diphtheria—numbered 11,786 or 17.9 per 100,000, in that year, the rate having fallen from 43.3 in 1900. This decline of nearly 59% is relatively greater than that shown by any other important cause of death. The rate has not fallen continuously, but has fluctuated somewhat from year to year.

"Diabetes was the cause of 10,666 deaths, or 16.2 per 100,000. The rate from this disease has risen almost continuously from year to year since 1900, when it was 9.7 per 100,000.

"The mortality rate from typhoid fever has shown a most gratifying decline since 1900, having decreased from 35.9 per 100,000 in that year to 15.4 in 1914, or by 57%. This decline has been almost as great, relatively, as that for diphtheria, and has been greater than that for any other principal cause of death. The total number of deaths due to typhoid fever in 1914 was

10,185. The marked decrease in the mortality from this disease gives emphatic testimony to the effectiveness of present-day methods, not only of cure but of prevention. The efficacy of improved water-supply and sewerage systems, of the campaign against the fly, and of other sanitary precautions is strikingly shown by the reduction of the typhoid mortality rate to the extent of more than five-ninths in 14 years.

"The principal epidemic maladies of childhood—whooping cough, measles, and scarlet fever—were together responsible for no fewer than 15,617 deaths of both adults and children, or 23.7 per 100,000, in the registration area in 1914, the rates for the three diseases separately being 10.3, 6.8, and 6.6, respectively. In 1913 measles caused a greater mortality than either of the other diseases, but in 1914 whooping cough had first place. In every year since and including 1910, as well as in several preceding years, measles has caused a greater number of deaths than the much more dreaded scarlet fever. The mortality rates for all three of these diseases fluctuate greatly from year to year. The rates for measles and scarlet fever in 1914 were the lowest in 15 years, while that for whooping cough was considerably above the lowest recorded rate for this disease, 6.5 in 1904, although far below the highest, 15.8 in 1903.

"Deaths due to railway accidents and injuries totaled 7,062, or 10.7 per 100,000. This number includes fatalities resulting from collisions between railway trains and vehicles at grade crossings. The death rate from railway accidents and injuries is the lowest on record and shows a most marked and gratifying decline as compared with the rate for 1913, which was 13 per 100,000, and a still more pronounced drop from the average for the five-year period 1906-1910, which was 15 per 100,000.

"Deaths resulting from street-car accidents and injuries numbered 1,673, or 2.5 per 100,000. This rate, like that for railway fatalities, is the lowest on record and shows a material falling off as compared with 1913, when it was 3.2, and as compared with the average for the five-year period 1906-1910, which was 3.7.

"The number of suicides reported in 1914 was 10,933, or 16.6 per 100,000 population. Of this number, 3,286 accomplished self-destruction by the use of firearms, 3,000 by poison, 1,552 by hanging or strangulation, 1,419 by asphyxia, 658 by the use of knives or other cutting or piercing instruments, 619 by drowning, 225 by jumping from high places, 89 by crushing, and 85 by other methods."

The census bureau has subsequently issued a further bulletin in which it appears that the town of Wakefield has the lowest death rate in Massachusetts, and in this respect ranks eleventh in the United States. Its death rate per thousand of population for the year ended July 1, 1914, was only 8.9, as compared with 12.9 of the preceding year.

"The census is for 435 cities and towns of the country with populations ranging from 10,000 to 100,000 and represents about two-thirds of the total population of the country.

"The only other places having a better standing than Wakefield, Mass., are Berkeley, Cal.; Manchester, Ct.; Ishpeming, Mich.; West Hoboken and West Orange, N. J.; Norwood, O.; Bellingham, Everett, Tacoma and Walla Walla, Wash., and Kenosha and Marinette, Wis.

"In this state, next to Wakefield, Revere and Winthrop are tied with an average of 9.7, and other places having an average of only a fraction over 10 per 1000 are Webster, Leominster, Southbridge, Everett, Newton and Watertown.

"Taunton has the highest death rate—22.5—but there is an insane asylum there. Chelsea is next with 21.0."

SOCIETY NOTICES.

NEW ENGLAND PEDIATRIC SOCIETY.—The forty-third meeting of the New England Pediatric Society will be held in the Boston Medical Library, Friday, March 31, 1916, at 8.15 P.M.

The following papers will be read:

1. "Dystonia Musculorum Deformans, Oppenheim's New Disease of Children and Young Adults." Dr. Isador H. Coriat, Boston.
2. "Further Experiences with Homogenized Olive Oil Mixtures." Dr. Maynard Ladd, Boston.
3. "A Study of First Examinations, with a Report of Fifty Consecutive Physical and Mental Examinations of So-Called Well Children." Dr. William R. P. Emerson, Boston.

Light refreshments will be served after the meeting.

RICHARD M. SMITH, M.D., *Secretary*,
A. C. EASTMAN, M.D., *President*.

THE HARVEY SOCIETY.—The ninth lecture of the series will be held at the New York Academy of Medicine, 17 West Forty-Third Street, on Saturday evening, March 25, 1916, at 8.30, by Dr. R. T. Woodyatt, University of Chicago. Subject: "On Intermediate Carbohydrate Metabolism."

THE NORFOLK DISTRICT MEDICAL SOCIETY.—A regular meeting of the Society will be held at the Infants' Hospital, Tuesday, March 28, at 4 P.M., sharp. Telephone Brookline 5500. Inspection of Hospital, Business, Demonstration of diagnostic and therapeutic measures employed in infancy. The Censors will meet May 11, at 2 P.M., for the examination of candidates. Annual meeting May 9.

BRADFORD KENT, M.D., *Secretary*.
798 Blue Hill Avenue, Dorchester.

PETER BENT BRIGHAM HOSPITAL.—There will be a medical meeting in the amphitheatre of the Peter Bent Brigham Hospital, on Tuesday evening, March 28, at 8.15 o'clock.

PROGRAM.

Informal Reports upon Current Work in Diabetes: 1. The Respiratory Quotient in Diabetes, Professor F. G. Benedict; 2. The Significance of Blood Fat in Diabetes, Professor W. R. Bloor; 3. The Carbon Dioxide Tension of the Aveolar Air in Diabetic Patients, Dr. A. A. Hornor; 4. The Prevention and Treatment of Diabetic Acidosis Without the Use of Alkalis, Dr. E. P. Joslin.

Medical students and physicians are cordially invited. Telephone, Brookline 5260. Any visitors may be on telephone call if their names are left at the front office of the Hospital.